BUREAU OF HYGIENE AND TROPICAL DISEASES.

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MEDICAL ZOOLOGY.

v. Brand (Th.). Quantitative Untersuchungen über die Zystenausscheidung von *Entamoeba histolytica* und *Lamblia intestinalis* bei einem gesunden Dauerausscheider. [**Quantitative Investigation of the Cyst-Outcome of** *Entamoeba histolytica* **and of** *Lamblia intestinalis* **in a Healthy Carrier.**]—*Zent. f. Bakt.* I. Abt. Orig. 1932. Jan. 11. Vol. 123. No. 5/6. pp. 358–365. [12 refs.]

In a healthy carrier of cysts both of *Entamoeba histolytica* and of *Giardia lamblia* the number of cysts of the two species passed during a term of more than 3 months is compared. After a yatren cure the *histolytica* cysts diminished in numbers, and at last disappeared ; whereas the *lamblia* cysts throughout were not perceptibly influenced in numbers. (The actual figures and numerical proportions day by day are given in a table.) The inference drawn is that, in this case at any rate, the histolytica encysted exclusively in the lumen of the gut.

A. Alcock.

Shortt (H. E.) & Swaminath (C. S.). **Life-History and Morphology of** *Trypanosoma phlebotomi* **(Mackie, 1914).**—*Indian Jl. Med. Res.* 1931. Oct. Vol. 19. No. 2. pp. 541–564. With 2 text figs. & 24 figs. on 5 plates.

Trypanosoma phlebotomi (Mackie 1914) (=*Herpetomonas phlebotomi* of Mackie) is here explained to be the proper name, in accordance with the rules, of illusions subsequently described as *Crithidia phlebotomi* of Mackie et al. and *Bodo phlebotomi* of Shortt. Its reptile host is *Hemidactylus frenatus*, a common gecko lizard of Assam ; the insect host is determined to be *Phlebotomus babu* var. *Shortti*.

This is a fine comprehensive study, although its particular details do not come strictly within our purview. The occurrence and the morphology of the trypanosome in the lizard host are described in great detail, and in equally well-considered detail its life-history and various developmental stages in the insect host are followed out.

In a very early stage of development in the gut of the insect the ingested trypanosomes have become motionless ovoid or nearly

spherical bodies devoid of their undulating membrane and having a very distinct periplastic membrane. About 24 hours afterwards these spherical bodies have grown and assumed the form of definite *cysts* containing from 40 to 60 highly refracting bodies enmeshed in a granular matrix. Each of these encysted refracting bodies represents a trypanosome of proliferation and their number indicates a very active process. The authors emphasize the occurrence of this early proliferation within a free and *independent* cyst, which, as they point out, differs radically from the intracellular phase in the development of *T. lewisi* described by MINCHIN and J. D. THOMSON.

In the final stage of development (reached at the 8th or 9th day after ingestion by the fly) the infection is superlative. Not only do the active forms of the trypanosome swarm in every part of the midgut and invade even the Malpighian tubules, but also the hindgut and rectum are distended by packs of parasites too tightly to permit movement.

Method of retransfer of the infection from the fly to the lizard are discussed—infection by bite of fly through skin of lizard contaminated by fly's disjecta ; ingestion of fly's infected excreta by lizard ; and swallowing of infected fly by lizard—the last being the conclusion suggested and supported to a certain extent by experiment. *A. A.*

HOARE (Cecil A.). **Studies on *Trypanosoma grayi*. III. Life-Cycle in the Tsetse-Fly and in the Crocodile.**—*Parasitology*. 1931. Nov. Vol. 23. No. 4. pp. 449–484. With 97 figs. on 4 plates & 3 text figs. [43 refs.]

This is a fine and well-reported study. *Trypanosoma grayi* is one of the largest trypanosomes (blood-forms measuring up to 91 μ) and seems to be harboured by a majority of the crocodiles in L. Victoria and to be non-pathogenous to them. The reptile appears to have a *natural* tolerance that keeps the numbers of the parasite low although not imparting immunity to invasion.

When fed on an infected crocodile the intermediary tsetse-fly (*Glossina palpalis*) takes in not more than about six trypanosomes. These begin to develop in the midgut as crithidia and trypanosomes and later complete their evolution in the hindgut as infective metacyclic trypanosomes which are voided with the faeces and infect the crocodile *per os*. The distribution of the parasite in the course of its development in the gut of the fly is determined by the peritrophic membrane and involves three consecutive currents of migration, namely (1) backwards from the intra-peritrophic space into the colon, thence (2) forwards into the extraperitrophic space and the midgut, and finally (3) backwards to the hindgut.

Evidence is advanced to show that the so-called cysts to *T. grayi* are artifacts. The co-relatives of *T. grayi* are indicated. *A. A.*

TSUCHIYA (H.). **The Localization of *Giardia canis* (Hegner, 1922) as affected by Diet.**—*Amer. Jl. Hyg.* 1932. Jan. Vol. 15. No. 1. pp. 232–246. [16 refs.]

A well-reported study of *Giardia canis* in four puppies experimentally infected, and fed two of them on a richly carbohydrate and two on a richly protein diet. The intestinal distribution of trophozoites in this

study suggested (*a*) that a carbohydrate diet favoured the development of the flagellate and that a high protein diet did not, and (*b*) seemed to indicate that there was no correlation between the distribution of the flagellate in the intestine and the varying specific nature of the bacterial flora; encystment, however, occurred at the level where the bacterial flora commenced to show a "complex" facies—suggestive of an environment (induced by large numbers of bacteria) unfavourable to trophozoites. From the nature of the distribution of *G. canis* in this study the author concludes that the zone of its "optimum localization" is the lower part of the duodenum and the entire jejunum, and that the zone of its encystment is the large intestine, especially the caecum.

A. A.

TSUCHIYA (H.). **Studies on Diversity of Strains in *Giardia canis* (Hegner, 1922) and their Biological Variations as affected by Diet.**—*Amer. Jl. Hyg.* 1931. Nov. Vol. 14. No. 3. pp. 577–599. With 3 graphs. [28 refs.]

The author finds that there are—as in man—two strains of Giardia in the dog, differing in shape and size and in some details of structure. Change of diet may influence the normal course of cyst development in *Giardia canis*, but whether the change of diet acts directly, or indirectly by changes in the bacterial flora of the dog's intestine, is a question to be answered. *A. A.*

KOFOID (Charles A.) & MCNEIL (Ethel). **The Advantages of Locke's Blood Medium in the Culture of Parasitic Protozoa of the Digestive Tract.**—*Amer. Jl. Hyg.* 1932. Jan. Vol. 15. No. 1. pp. 315–317.

The authors recommend as "a very stable medium, and therefore very satisfactory for maintenance of cultures over considerable periods of time," one "known as the L.-E.-B. medium" invented in 1925 by Kofoid and WAGENER. The egg slants are made up of 4 eggs and 50 cc. Locke's solution inspissated at 15 lb. pressure for 30 minutes; the solution consists of Locke's solution 500 cc. and fresh defibrinated rabbit-blood 2·5 cc. Instances of the varied and successful employment of this medium are given. *A. A.*

KOFOID (Charles A.), MCNEIL (Ethel) & KOPAC (M. J.). **Chemical Nature of the Cyst Wall in Human Intestinal Protozoa.**—*Proc. Soc. Experim. Biol. & Med.* 1931. Oct. Vol. 29. No. 1. pp. 100–102.

This study from the Zoology Dept. of California University, Berkeley, was made on cysts of *Entamoeba histolytica*, Endolimax, "Councilmania," and *Giardia lamblia*. Suitable tests for cellulose, chitin, and lipoid were negative. Suitable tests pointed to the only possible conclusion "that the cyst-wall belongs to the albuminoid or scleroprotein group" and has the properties of the group of keratins more nearly than of any other group of scleroproteins. *A. A.*

DAVID (N. A.), ANDERSON (H. H.), KOCH (D. A.) & LEAKE (C. D.). **Comparative Toxicity and Protozoacidal Action of Acetarsone, Carbarsone, and Certain Related Pentavalent Arsenical Compounds.**—*Proc. Soc. Experim. Biol. & Med.* 1931. Nov. Vol. 29. No. 2. pp. 125–128.

"Comparative oral toxicity studies on guineapigs, rabbits, and cats, and a comparative protozoacidal evaluation on amebae *in vitro* as well as on natural balantidial infestations in guineapigs and on natural monkey

amebiasis indicates that 4-carbamino-phenyl-arsonic acid ('carbarsone') has definite advantages from the standpoint of application to anti-amebic therapy over acetarsone ('stovarsol'), tryparsamide, 'proparsamide,' 'iso-butarsamide,' and 'n-butarsamide.' It is definitely less toxic on oral administration than these compounds and seems generally more protozoacidal in tolerated doses." This is the authors' own summary. *A. A.*

MAYER (Martin). Ueber die Anämieerreger von Menschen und Tieren, sogenannte Bartonellen. [**On the So-called Bartonella, the Anaemia-Excitant of Man and Beasts.**]—Reprinted from *Internat. Ärztlicher Fortbildungskursus.* 1930. Vol. 12. pp. 309–324.

An excellent and authoritative summary of the anaemias provoked in man and animals by Bartonella. [The story of Bartonella up to the year 1929 is recorded in this *Bulletin,* Vol. 26, pp. 519–524.] *A. A.*

CLELAND (J. Burton). **Insects in their Relationship to Injury and Disease in Man in Australia. Series III.**—*Med. Jl. Australia.* 1931. Dec. 5. 18th Year. Vol. 2. No. 23. pp. 711–713. [19 refs.]

This does not profess to be an exhaustive paper. References are given to original records and reports. Among these are references to cases of infestation by blowfly maggots; to attacks by Simulium—rare in Australia; to cases of death and of anaphylactic shock from bee-stings; to coleoptera, hemiptera, and tree-crickets that may bite man; to cockroaches that may gnaw the nails and skin of sleepers; and to stings from wasps and hornets; and bites from mosquitoes, biting flies, and fleas. References are also to be found to cases of injury by swarms of exasperated ants; in one case a man helplessly intoxicated, who had fallen on an ant-heap was found lifeless, with "the interior of his nostrils and throat" eaten away; in another similar case the man was found with his nose and upper-lip and penis partly eaten away by the ants. *A. A.*

POMEROY (A. W. J.). **A Report on the Mosquito and Tsetse Problem at Takoradi, 1930-31.**—*Gold Coast Rep. of Laboratory Services Year 1930-31.* Appendix G. pp. 43–60. With 2 charts, 3 folding maps & 3 coloured folding tables.

Takoradi is a maritime township of the Gold Coast, and this report deals chiefly with its mosquitoes, their local incidence, their local breeding-places and the pH value and the salinity of the water, and local drainage. Of 2,551 mosquitoes caught at ten definite stations and at weekly intervals in human habitations during eight months (May-October) 2,159 were *Anopheles gambiae.* Among the exiguous remainder there were 16 *A. funestus,* 19 *A. pharoensis,* 54 *Aedes argenteus,* 42 *Mansonioides africanus* (although Pistia marsh was not found in the locality) and a few each of sixteen other species of Culicines. Of 395 specimens of *A. gambiae* dissected during June-October, 28 were found infected with malaria (oocysts); much infestation with undetermined Nematodes was observed also in this species. The tsetse-flies observed during 8 months (June-January) were *G. longipalpis* (most abundant), *G. palpalis,* and *G. medicorum* (4 individuals). *A. A.*

GALLIARD (Henri). Culicides du Gabon. II. Culicinés. Remarques sur la biologie des *Mansonioides* et d'*Aedes* (*Stegomyia*) *argenteus* Poiret. [**Culicini of Gabun. Biology of** *Mansonioides* **and of** *Aedes argenteus*.]—*Ann. Parasit. Humaine et Comparée.* 1931. Nov. 1. Vol. 9. No. 6. pp. 514–529. With 9 text figs. [17 refs.]

Brief notes with some parcel figures on 22 species of Culicini of Gabun. Of *Mansonioides uniformis* and *M. africanus* the author states that they are the most ubiquitous, most ferocious, and most persistent of all the culicine pests of human dwellings, not being deterred by wind or rain nor, in places where there are good-sized rivers, being suppressed in the dry season. Of natural mischances that may befall *Aedes argenteus* he tells the following native story, which was confirmed by a colonist: Near villages in the forest there always are clearings for plantations of taro, the Aroid whose tubers form the staple food of the natives; the water that collects within the spathe that encloses the flowers of this Aroid appears to be suitable for the larvae of *A. argenteus*, but the flowers have a viscid secretion that attracts and clogs the mosquitoes, to such a climax, in some villages, as in a few years to lead to the local disappearance of the species.

A. A.

HINMAN (E. Harold). **The Winter Breeding and Activity of Culicine Mosquitoes at New Orleans (30°N. Lat.).**—*Amer. Jl. Trop. Med.* 1931. Nov. Vol. 11. No. 6. pp. 459–466. With 2 figs. on 1 plate. [14 refs.]

Periodic survey for about 9 months (Sept. 1930 to June 1931). After a monthly mean temperature of 52.5°F. has been reached there is little outdoor breeding of *Aedes aegypti*, although indoor breeding continues during the coldest months. *Culex quinquefasciatus* [=*fatigans*] and *C. salinarius* continue outdoor development throughout the year, although oviposit may cease during part of January and February. *A. A.*

HEYDON (G. M.). **Some Common Queensland Mosquitoes as Intermediate Hosts of** *Wuchereria bancrofti* (*Filaria bancrofti*).—*Parasitology.* 1931. Nov. Vol. 23. No. 4. pp. 415–427. [19 refs.]

This good paper on common Queensland Mosquitoes in relation to filariasis shows *Anopheles amictus* to be almost equal to *Culex fatigans* as an intermediary host of Bancroft's filaria and *Aedes vigilax* a poor and *Culex sitiens* an insecure host; and confirms the observations of Low and others on the inhospitality of *Aedes argenteus*. *A. A.*

ACHUNDOW (I.). Zur Frage der Biologie und das Vorkommen von *Stegomyia fasciata* in Baku (Aserbeidschan, USSR.). [**Biology and Occurrence of Stegomyia in Baku.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1932. Jan. Vol. 36. No. 1. pp. 31–33.

The only points to note here are that "*Stegomyia fasciata*" occurs in considerable numbers in Baku, adopts wooden washtubs and other

domestic gear for its breeding furniture, and is stated to complete its development there in the laboratory and at a water temperature averaging 25°C., in 9 to 10 days, from egg to complete (fertig) fly.

A. A.

FÜLLEBORN (F.). Ueber den Saugakt der Stechmücken. [**On the Act of Suction by Gnats.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1932. Apr. Vol. 36. No. 4. pp. 169–181. With 5 text figs.

The devised experiments on the process of suction in the female *Anopheles maculipennis* here described and illustrated in text-figures support the conclusion that it is the issue of a reflex action. In the case of the insect deprived of its labium, when the tip of the bundle of stylets that forms the pricking and sucking tube is brought in contact with a fluid, the fluid does not—as the author formerly thought—ascend by capillarity, but is aspirated by the initiatory gulp-like working (Schluckbewegungen) of the insect's sucking-pump; and when the insect's mouth-cavity is full of fluid this spasmodic action of the pump becomes converted into a more or less continuous flow until the abdomen is fully distended; this purely reflex process is best observed in the insect deprived of labium because it can nearly always be brought to suck. Compulsory sucking, however, is not easy to bring about in females with the labium intact; but when it is effected one frequently can see alternate to and fro twitchings of the labella and sometimes also agitation of the stylets; this shows that the reflex illustrated in compulsory feeding can be influenced by the insect's "volition." That one is dealing with a purely reflex action is proved above all by the facts that caustic and poisonous fluids are sucked up as readily as water and defibrinated blood, and that suction can continue until the abdomen is distended, and even after decapitation during the act of sucking. [For some interesting work on this subject, by M. E. MACGREGOR, see this *Bulletin*, Vol. 28, p. 504.]

A. A.

MANALANG (C.). **Origin of the Irritating Substance in Mosquito Bite.**—*Philippine Jl. Sci.* 1931. Sept. Vol. 46. No. 1. pp. 39–45. With 2 figs. on 1 plate.

Observations of 4 local species of Anopheles, of *Culex fatigans*, and of *Aedes aegypti* showed that inoculation of the contents of their salivary glands into the human skin caused "a typical bite reaction" (contrary to SCHAUDINN's observation) equally with the contents of the diverticula. Individual susceptibility to irritation of course varies in degree.

A. A.

ANDERSON (Drysdale). **Notes on Mosquito-borne Diseases in Southern Nigeria. A Statistical Study in Anopheline Breeding Places.**—*Jl. Trop. Med. & Hyg.* 1931. May 15. Vol. 34. No. 10. pp. 131–133.

This is a methodical and critical study of the local nursery-grounds of *A. gambiae* (=*costalis*) and *A. funestus*, the two outstanding carriers of malaria in S. Nigeria. *A. gambiae* prefers streams rather than ponds,

and open rather than shady waters ; it is not affected by the surface of the water, but has a slight preference for muddy waters and is to be found where the banks are clear of deep-growing vegetation. *A. funestus* although quite at home in pond or stream, much prefers swamp ; its predilections are for shaded waters and for deep-growing vegetation ; it is not affected by the clearness or otherwise of the water or by the nature of the surface. *A. A.*

ANDERSON (Drysdale). **Notes on Mosquito-borne Diseases in Southern Nigeria. II. Mosquito Intensity and Infectivity in Relation to Malaria.**—*Jl. Trop. Med. & Hyg.* 1931. Dec. 1. Vol. 34. No. 23. pp. 389–390.

Actual dissections of mosquitoes during the malaria season show that the infection is disseminated, in the localities studied, almost entirely by *A. gambiae* (=*costalis*) and *A. funestus*. Statistics of infection are given for *A. gambiae* ; the frequency of this species is highest in May-June and its infection-rate rises during this time.

A. A.

EVANS (A. M.). **Observations made by Dr. M. A. Barber on a Melanic, Coastal Race of** *Anopheles costalis*, **Giles** (*Gambiae*) **in Southern Nigeria.** —*Ann. Trop. Med. & Parasit.* 1931. Dec. 31. Vol. 25. Nos. 3 & 4. pp. 443–453. [11 refs.]

This " melanic " race, breeding in brackish swamps near Lagos, can develop in normal term in water of saltness equal to 46 per cent. seawater.

A. A.

DE MEILLON (Botha). **Illustrated Keys to the Full-grown Larvae and Adults of South African Anopheline Mosquitoes.**—*Publications of South African Inst. Med. Res.* 1931. Sept. Vol. 4. No. 28. pp. 275–375. With 200 figs. on 40 plates.

For matter, method, and style, as well as for full and elegant artistic presentation and for practical purpose this finished study of the full-grown larvae and adult females of the South African Anopheline Mosquitoes stands supreme. The obvious distinctive characters of the species are represented in parcel figures on forty beautiful quarto plates, two plates, one for the larva and the other for the adult, being allotted to each species. Besides keys and succinct diagnostic descriptions of species instructive accounts of general and superficial anatomy and of methods of preservation and examination of specimens are given. *A. A.*

GALLIARD (Henri). Culicides du Gabon. III.—Anophelinés. [**Anophelines of Gabun.**]—*Ann. Parasit. Humaine et Comparée.* 1932. Jan. 1. Vol. 10. No. 1. pp. 85–95. With 6 text figs. [Refs. in footnotes.]

In this part the anophelines of the Gabun are critically noticed—*mauritianus, gambiae, funestus, hargreavesi* (=*marshalli* var.), *pharoensis,*

rufipes, and *wellcomei*—in the distinctive characters of the adult and the larvae, and in certain observed variations. Here again *funestus* and *gambiae* are signalized as the chief carriers of malaria. *A. A.*

EVANS (A. M.). **Notes on African Mosquitoes.**—*Ann. Trop. Med. & Parasit.* 1932. Mar. 19. Vol. 26. No. 1. pp. 85–108. With 7 text figs. [17 refs.]

Notes (descriptive) on the pupae of some African Anopheles; on mosquitoes collected in Liberia; and on the taxonomic position of *Anopheles freetownensis*. *A. A.*

COVELL (G.). **The Distribution of Anopheline Mosquitoes in India.**—*Health Bull. No. 17. Malaria Bureau No. 8.* 39 pp. With 1 map. 1931. Calcutta: Govt. of India Central Publication Branch. [As.4 or 5d.]

In this very useful publication Part I gives the distribution of Anopheline mosquitoes in India and Ceylon by species, listed in alphabetical order. Part II gives their distribution by Sub-divisions, Districts, or States, which also are placed in alphabetical order; a key map of India and Ceylon shows the geographical boundaries of these political sub-divisions. *A. A.*

IYENGAR (M. O. T.). **Anopheles Breeding in Relation to Season.**—*Indian Jl. Med. Res.* 1932. Jan. Vol. 19. No. 3. pp. 917–939. With 12 charts in text.

Records of a systematic survey of all kinds of Anopheles' natural breeding-waters in a rural area including eight large villages, in the plains of Lower Bengal. The survey continued for a term of more than five years and the breeding-places were visited twice a month during that time. Eleven species were recognized, and although most of them bred all the year round each species had its definite season of increase. Of all the species there were only four—*aconitus, varuna, philippinensis*, and *tessellatus*—in which this season of increase corresponded with the season of malaria. *A. A.*

SWEET (W. C.) & RAO (B. A.). **Dissections of Female Anophelines in Mysore State.**—*Records of the Malaria Survey of India.* 1931. Dec. Vol. 2. No. 4. pp. 655–657.

This malaria-mosquito inquest of the Mysore State was continued from 1st October 1928 to 31st December 1930—twenty-seven months. Three stations were established in different parts of the country and collections of living adult anophelines were made "bi-weekly" at definite places in each station. Furthermore, supplementary collections were made during the course of the inquest at three places where epidemics of malaria were reported. The captured insects were kept alive usually for 72 hours before examination.

Dissections (stomach and glands) of 31,277 of them were made and checked. These dissections comprehended nineteen species—6,377 *jeyporiensis*, 5,980 *subpictus*, 1,224 *aconitus*, 1,135 *vagus*, 788 *fuliginosus*, 487 *jamesii*, 223 *hyrcanus* var. *nigerrimus*, 220 *tessellatus*, 137 *pallidus*,

200 collectively of *barbirostris*, *karwari*, *maculipalpis*, and *philippinensis*, and a trifle (14) of *turkhudi*, *leucosphyrus* and *majidii*; but no infection is recorded in any of the 16,785 individuals of these sixteen species. Infection was discovered only in 8 individuals (1 stomach, 7 glands) of 5,748 *culifacies* dissected; in 1 individual (glands) of 6,034 *listonii* dissected; and in 2 individuals (stomach) of 2,710 *stephensi* dissected. (Infections reported in 56 individuals of various species were not confirmed by final expert criticism). *A. A.*

RUSSELL (Paul F.). **Daytime Resting Places of Anopheles Mosquitoes in the Philippines. First Report.**—*Philippine Jl. Sci.* 1931. Dec. Vol. 46. No. 4. pp. 639–649. With 7 figs. on 4 plates [26 refs.]

A short review of "the problem" of catching adult anophelines in their day-time resting-places in tropical countries, as exemplified in published reports. Besides houses and sheds for domestic animals, the author notices in the Philippines the sides of wells, crevices in the soil and in shaded old stone walls, and shaded and overgrown banks of streams as resting-places, observed in routine collecting. Some photographs of such resting-places are given. *A. A.*

KING (W. V.). **The Philippine Anopheles of the Rossi-Ludlowi Group.**—*Philippine Jl. Sci.* 1932. Mar. Vol. 47. No. 3. pp. 305–342. With 4 plates & 6 text figs. [20 refs.]

This is another of those strenuous exertions on the hill of taxonomy that put one in mind of the labours of Sisyphus the son of Aeolus. The author recognizes in the Philippines five species of Anopheles of "the *rossi-ludlowi* group" and here gives the characters which he considers to be distinctive of each and his conclusions in the matter of nomenclature. *A. A.*

MORISHITA (Kaoru). **Comparison of Formosan Anophelines with Related Forms from India and Malaya with Regard to the Problem of their Identification.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1932. Feb. Vol. 31. No. 2 (322). [In Japanese. English summary pp. 17–20.]

According to the author who has made critical comparisons in India, the F.M.S., and Java, the species of Anopheles represented in Formosa are *sinensis*, *minimus*, *tessellatus*, *fuliginosus*, *maculatus*, *maculipalpis* var. *indiensis*, *ludlowi*, and *jeyporiensis*. *A. A.*

DE BUCK (A.) with SWELLENGREBEL (N. H.). Das Vorkommen von zwei verschiedenen Rassen des *Anopheles maculipennis*, als Erklärung des Anophelismus sine Malaria in Niederland. [**The Existence of Two Different Races of** *Anopheles maculipennis* **as an Explanation of Anophelism without Malaria in the Netherlands.**]—Reprinted from *Verhandl. d. Deut. Zool. Gesellschaft.* 1931. pp. 225–230. With 1 text fig.

[The essentials of this paper have already been stated in a paper by these authors and E. SCHOUTE, which has already been abstracted in Vol. 27, pp. 910–911 of this *Bulletin*. In that abstract reference is given to earlier papers on the subject.]

Here, the differences, morphological and biological, between the two races are more formally stated and the difference in their eggs is figured. *A. A.*

MARTINI (E.), MISSIROLI (A.) & HACKETT (L. W.). Versuche zum Rassenproblem des *Anopheles maculipennis*. [**The Race Problem of** *A. maculipennis*.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1931. Nov. Vol. 35. No. 11. pp. 622–643. With 5 text figs.

The authors refer to ROUBAUD'S " zoophile " race in non-committal terms, and to the Netherlands *atratus* race of the Dutch observers, both of which have been noticed frequently in this *Bulletin*; but their attention is here focussed on FALLERONI'S *labranchiae* and *messeae* varieties of *Anopheles maculipennis*, the former with lighter, the latter with darker eggs. These and other varieties of eggs of the species are differentiated with an abundance of excellent figures. The paper is of interest to malariologists in countries where *A. maculipennis* is the only ubiquitous species, and in localities there where a formal explanation of the phenomenon of anophelism without malaria is sought. *A. A.*

ACHUNDOW (I.). Die Fauna der Culicidae der Republik Aserbeidschan. [**Culicid Fauna of Azerbaijan.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1931. Nov. Vol. 35. No. 11. pp. 671–677. With 3 text figs. [10 refs.]

Malaria is the prevalent malady in the republic of Azerbaijan. Seven species of Anopheles exist there—*maculipennis, elutus, bifurcatus, nigripes, pseudopictus* (*hyrcanus*), *superpictus*, and *pulcherrimus*; the author describes their local distribution and goes into details of breeding-place and comparative importance. *A. A.*

HERMITTE (L. C. D.). **Occurrence of** *Anopheles gambiae* (*costalis*) **in Aldabra Islands (Seychelles).**—*Records of the Malaria Survey of India.* 1931. Dec. Vol. 2. No. 4. pp. 643–654. With 2 maps in text & 12 figs. on 3 plates.

The Mahé or Seychelles Archipelago includes a number of small islands (of which Mahé is the largest) that spring from the greatest depths of the Indian Ocean in an area about fifteen-hundred miles to the north-east of Madagascar. Some of these islands are mere atolls, but most of them are rocky and mountainous. The Seychelles have an established reputation as " being extremely healthy and above all free from malaria and its transmitter the Anopheles."

At several points in the oceanic depths between the Seychelles group and Madagascar there are other clusters of coral banks and coral islets —the Amirante, the Alphonse, the Providence, the Aldabra groups—which, though severally distinct and distant, are included in the Seychelles administration. It is of these, and in particular of Aldabra, that this paper treats, since Aldabra was convicted of a malaria epidemic in 1908, and—as here reported—was discovered quite lately to be infested with *Anopheles gambiae* (=*costalis*), the dangerous African malaria-carrier, now become notorious as a dexterous coloniser in countries far beyond the African continent. Before the year 1908 not any case of malaria had been known to originate in any of these groups. In April of that year, about three weeks after the arrival of a

ship carrying some coolies from a notoriously malarious district in Madagascar, an outbreak occurred in Aldabra. The epidemic was active until the end of September. At the end of January 1909 the atoll [Aldabra] was quite free from the disease. During and after this outbreak " exhaustive searches " were made for a criminal Anopheles, but the result was fruitless, the only larvae found were Culex and Stegomyia." After the epidemic of [April-September] 1908 malaria was never heard of again in Aldabra until [October-November] 1930" ; and this time larvae of *Anopheles gambiae* were discovered " in profusion " in the western island of the atoll. *A. A.*

ROY (D. N.). **The Natural Breeding Habits of *A. stephensi* as observed in Calcutta.**—*Indian Jl. Med. Res.* 1931. Oct. Vol. 19. No. 2. pp. 617–628.

——. **On the Ovulation of *A. stephensi*.**—*Ibid.* pp. 629–634.

——. **On the Breeding Habits of *A. stephensi* as observed in the Laboratory.**—*Ibid.* pp. 635–639.

It is here stated that *Anopheles stephensi* is at present the only dangerous species that breeds in the " central portion " of Calcutta. [In 1905 another dangerous species, *A. listoni*, kept company with it in the European centre of Calcutta]. Its permanent breeding-places there are overhead cisterns, builders' vats for soaking bricks, tanks, and drains ; for temporary nurseries it has in the rainy season puddles and the tins and such-like thrown out by the blunt monster with uncounted heads. It is essentially a surface feeder. The adult female feeds on any kind of warm-blooded animal ; if correlatively fed it can produce 3 batches of eggs ; one individual delivered 8 batches. The eggs don't stand drying. *A. A.*

BRADLEY (G. H.). **Feeding Tests of Anopheline Mosquitoes with Leguminous Plants.**—*Jl. Econom. Entom.* 1931. Dec. Vol. 24. No. 6. pp. 1229–1233.

With reference to the argument of WILLCOCKS and of D'HERELLE attributing the absence of malaria in cultivated Egypt to the abundance of clovers and other Papilionaceae that contain coumarin, a substance claimed to be able to make mosquitoes resistant or immune to malaria, the observations of the present author, whose experiments were made with three common species of N. American Anopheles, and clover and six other kindred species of plants " seem to indicate that mosquitoes do not feed to any extent on either the blooms or foliage of legumes ; that legumes are not attractive to mosquitoes ; and that when confined in cages with legumes, mosquitoes obtain little if any sustenance from the plants." *A. A.*

PARROT (L.). Observations biologiques sur *Phlebotomus papatasi* (Scop.). [**Biological Observations of *Phlebotomus papatasii* (Scop.).**]—*Arch. Inst. Pasteur d'Algérie.* 1931. Sept. Vol. 9. No. 3. pp. 442–450. [23 refs.]

P. papatasii is bred in Algiers from a stock of captured females fed in and imported from Biskra. On arrival the eggs (and larvae already

hatched) are incubated at 22°, 25°, or 28°C. in pots of unglazed earthenware. The nutrient medium employed is garden soil heated to 65°–70° and mixed with 10 per cent. of dried pig-blood ; or ordinary earth with rabbit or lizard dung. The optimum of moisture is hard to define —let the surface of the medium look fresh and feel still crumbly, not wet. Development in the laboratory is influenced, but not too rigidly in every culture, by temperature ; at 22° the term from egg to adult ranges from 144 to 197 days ; at 25°, from 47 to 92 days ; at 28°, from about 39 or 43 days to about 69 or about 70 days. The author has not observed the phenomena called pseudohibernal asthenobiosis by ROUBAUD ; larval development has always been regular ; nor has any abnormal and excessive pause in pupation, or any precocious emergence of males, been noticed. Coupling of the sexes may occur either before or after the first feed of the female. Although laboratory-bred females may feed on the gecko *Tarentola mauritanica* quite readily, the author has never found nucleated red cells in the stomach of female *papatasii* caught in Nature—in striking contrast with *P. minutus* and *P. parroti*. Experiments with larvae and with females of *P. papatasii* descended from females fed on *Leishmania tropica* did not give any evidence of hereditary transmission of the infection ; and feeding attempts to infect *P. papatasii* with *Leishmania tarentolae* of the gecko disclosed P. *papatassi* to be not favourable as a host-species of *L. tarentolae*. *A. A.*

THEODOR (O.). **On African Sandflies (Dipt.).**—*Bull. Entom. Res.* 1931. Dec. Vol. 22. Pt. 4. pp. 469–478. With 6 text figs. & 5 figs. on 2 plates. [14 refs.]

A critical re-examination and revisal of some of the African species of Phlebotomus, with some short diagnoses of some new species. *A. A.*

TANGANYIKA TERRITORY. **Tsetse Research Annual Report for the Year ended 31st December, 1930** [SWYNNERTON (C. F. M.), Director].—pp. iii+48. With 12 figs. on 6 plates, 1 map & 1 chart. Dar-es-Salaam : Govt. Printer. [2s. 6d.]

This methodical investigation, qualified by its experimental trend, of tsetse-fly belts in Tanganyika shows them to consist of so-called " communities " [an unhappy term, since it suggests a definite social organization] seasonal or semipermanent, some of which are feeding-grounds and others breeding and resting-grounds, and it has also led to recognition of those kinds of environment that are the most—and the least—important to each species of fly as indicated by density, distribution and other circumstances of the environment and season. The better the country becomes known the stronger grows the conviction that there is no single method for extirpating fly, and that all reasonable methods must be tried experimentally. That various methods and results may be so studied simultaneously the fly-belt at Shinyanga has been split into blocks separated by clearings convenient for isolated experiment.

The sections of the Report that are of general interest are those dealing with (*a*) attempts to exterminate the fly ; (*b*) attempts to prevent its incursions and spread ; and (*c*) those on biology and bionomy.

(*a*) *Experimental Attack on the Fly*. Organized burning of grass late in the season has resulted in great reduction in the density of the fly in

some blocks. An unusually wet rainy season, ending in flooding of low-lying grass areas has contributed to this reduction by killing flies and drowning puparia and has suggested a plan of alternating years of fierce organized burning with years of intermission of burning. In areas where organized burning of grass is not applicable the following methods of "direct" attack have been experimentally tried :—Breeding and liberating *Syntomosphyrum glossinae*, the hymenopterous parasite of *G. morsitans*. Propagation of a pathogenous fungus of the fly. Bird-liming the backs of peripatetic bicyclists. Fly-catching by means of screens and various traps. Among traps Harris's trap has been favourably investigated by Dr. Phillips. All these methods, of course, assume an accurate and extensive knowledge of the haunts and concentrations of the fly. Among methods of "indirect" attack the following have been investigated :—Thinning of the bush by selective destruction of particular species of the flora. Complete cessation of grass-burning for long terms, the very long rank grass being obstructive to fly. Or, on the contrary, complete clearing of dense fly-centres and planting settlers there.

(*b*) *Experimentation in the creation of barriers against Fly.* First come solid Game barriers—palisades of living posts of Commiphora, of living epiphyte figs or of agave and other spiky and thorny shrubs, or of cuttings or seedlings, etc., of suitable trees ; here the interference of termites (although sometimes it may be useful) has to be watched. Next come obstructions to the spread of fly, and these may either be true barriers of dense thicket consisting of chosen belts of natural matted vegetation or of broad belts of thick evergreen plantation ; or on the other hand they may be broad open straits of felled and cleared jungle. Various methods of making these bare strips, by felling, injuring, or poisoning trees, or by the aid of termites are considered.

(*c*) *Biological and bionomical observations.* With regard to *G. morsitans*, flies do not emerge from pupae much during the wet seasons, the great emergence is just after the end of the big rains. Very few puparia have been found outside the customary sites. This species has preferences for certain types of woodland, where it concentrates and may be attacked in the later dry season. Only large movements of game cause a marked increase in fly density and female percentage. The fly seems to hunt entirely by sight. Female flies may be active in the early morning when humidity is high at a time when males are mostly inactive. Many observations have been made and are recorded at length about fly "centres" and concentrations—female centres, seasonal concentrations, male areas, and various other "types of concentration"—some of which are undoubtedly feeding grounds, although others still seem to be rather ill-defined. Much, however, has been learned of the relations of the fly to season and to its environment. With regard to *G. swynnertoni*, it lives in disconnected patches within the more open woodland, disliking dense bush and long grass, and it may travel more than two-thirds of a mile to its feeding-grounds, independent of artificial transport.

Since 1930 experiments have been carried on in working cattle undergoing injections of tartar emetic in fly country. Of 38 head of cattle so used 29 are alive and look well.

The general conclusion is that the Shinyanga scheme of "large field experimentation" has yielded results of high practical value and great promise. Of the enterprising spirit in which the experimentation has been conducted this report is a lively document. *A. A.*

STRONG (Richard P.), BEQUAERT (Joseph C.) & CLEVELAND (L. R.). **Report on the Available Evidence showing the Relation of Game to the Spread of Tsetse Fly borne Diseases in Africa.**—*Special Publication Amer. Committee on Internat. Wild Life Protection.* 1931. Vol. 1. No. 1. 46 pp. [Refs. in footnotes.]

Since the whole of this useful publication is an orderly summary of recorded evidence it is only needful to indicate the authors' considered conclusions and judgments, without comment. From impartial consideration of the evidence they conclude (1) That with regard to the species of trypanosomes responsible for sleeping sickness in man, the evidence considerably suggests that *T. gambiense* and *T. rhodesiense* are slightly varying races of a single species—the evidence that these are two distinct species being inconclusive. (2) That with regard to the proposition that wild game serve as hosts or reservoir of the specific trypanosome of the said malady the evidence in substantiation is (*a*) not extensive ; (*b*) to a considerable extent suggestive of doubt ; or at most (*c*) suggests " that a trypanosome of animal origin, in a few instances when the trypanocidal power of the human serum appears to be reduced, can adapt itself to man." Here the evidence which suggests that wild game may act as reservoir for *T. gambiense* of man is, of course, cited and adjudged.

The authors find (3) That along with some negative evidence " there is also some positive evidence that wild game act as the reservoirs for the trypanosomes which cause disease of domestic animals." In citing this evidence in their summary, they include J. F. CORSON's demonstration (since this report was written) that *T. rhodesiense* in blood from human cases of sleeping sickness when inoculated into sheep and goats will produce fatal trypanosome infection in those animals.

Their other pronouncements are that (4) " No definite proof has been submitted to show that the abundance of game has a definite relation to the number of tsetse-flies present in a given district. . . . (5) There is certain evidence presented which shows that tsetse-flies will sometimes migrate with game. (6) The relationship between the presence of game and the breeding-places of tsetse-flies varies somewhat with the species. In the case of *G. morsitans* and other tsetse-flies of similar habits, there is some evidence that the breeding-places are generally close to areas where wild game is fairly abundant. (7). . . there is little evidence that *G. palpalis* and *G. tachinoides* depend on wild game. In the case of *G. morsitans*, apparently this fly feeds chiefly in nature upon wild game."

Finally they conclude against the probability of exterminating either *G. palpalis* or *G. tachinoides* by eliminating wild game, though " there seems to be some evidence that *G. morsitans* will disappear when the large wild game animals are considerably reduced." *A. A.*

PEREKROPOFF (G. I.) & STEPANOFF (P. I.). Zur Frage der Darmerkrankungen des Menschen, die durch Octomitus bedingt sind. **[The Question of Octomitus as a Cause of Intestinal Disease in Men.]**—*Zent. f. Bakt.* I. Abt. Orig. 1932. Jan. 11. Vol. 123. No. 5/6. pp. 324–330. With 15 figs. on 1 plate. [10 refs.]

A ceremonious account (with a plate of figures) of *Octomitus rastegaiev* (described as a new species) found in the faeces of a patient (who seems

to have been definitely tuberculous at some time), who complained of chronic diarrhoea and of pain in the abdomen, gall-bladder, and liver. Chiefly from the fact that under treatment all these symptoms disappeared along with the disappearance of the Octomitus, the authors decide that Octomitus must be included among the intestinal parasites of Man. *A. A.*

DOS SANTOS (Ribeiro). Localisation rare de l'*Hypoderma bovis* chez l'homme. [**Rare Location of** *Hypoderma bovis* **in a Man.**]—*Ann. Parasit. Humaine et Comparée.* 1931. Nov. 1. Vol. 9. No. 6. pp. 512–513. With 2 text figs.

The larvae of *Hypoderma bovis* here figured were taken from the membrum virile of a Brazilian rustic. The man had a history of having innocently slept out in the grass, *sub Jove*, one night, but had attributed his affliction to the handmaids of Venus. *A. A.*

WALKER (E. M.). **Cutaneous Myiasis in Canada.**—*Canadian Public Health Jl.* 1931. Oct. Vol. 22. No. 10. pp. 504–508. With 2 text figs.

Cutaneous myiasis is said to be rare in Canada (or never reported) but since 1919 eight cases, all in infants, have come to the author's notice—in Toronto, Ontario, and Winnipeg—all due to *Wohlfahrtia vigil.* *A. A.*

PRADAL & SOUCHARD. Sur un cas de pseudo myase rampante observé en Cochinchine. [**A Case of Creeping Pseudo-Myiasis in Cochinchina.**] —*Bull. Soc. Méd.-Chirurg. Indochine.* 1931. Sept. Vol. 22. No. 8. pp. 615–618.

The usual intolerable itching attended the progress of the lesion. When the advancing end of the burrow was lanced, an ancylostome larva was discovered in the exudation. The wound healed in a few days, and the patient declared himself cured fifteen days afterwards. *A. A.*

SMIT (Bernard). **A Study of the Sheep Blow-Flies of South Africa.**—*Union of South Africa. 17th Rep. Director Vet. Services & Animal Industry, Onderstepoort, Pretoria.* 1931. Aug. Pt. 1. pp. 299–421. With 9 plates (3 coloured), 5 diagrams (4 folding) & 5 figs. [177 refs.]

Although the discourse is of blow-flies whose maggots torment and destroy sheep in S. Africa and hamper the wool-trade it contains much information on the habits, bionomy, biology, parasites, deterrents of these scourges that is informative to the medical and sanitary zoologist. *A. A.*

HOBSON (Ralph Percival). **On an Enzyme from Blow-Fly Larvae** (*Lucilia sericata*) **which digests Collagen in Alkaline Solution.**—*Biochem. Jl.* 1931. Vol. 25. No. 5. pp. 1458–1463. With 1 text fig.

The proteolytic enzymes, obtained from the excreta of larvae of *Lucilia sericata*, digest collagen (from tendo Achillis of ox and from catgut) and elastin (from ligamentum nuchae of ox), but not keratin

(from pure wool). The enzyme that digests collagen is produced by the cells of the midgut. The excreta digest collagen in alkaline solution. The separate existence of collagenase is inferred from absorption and stability experiments. *A. A.*

KING (H. H.) & PANDIT (C. G.). **A Summary of the Rat-Flea Survey of the Madras Presidency, with a Discussion on the Association of Flea Species with Climate and with Plague.**—*Indian Jl. Med. Res.* 1931. Oct. Vol. 19. No. 2. pp. 357–392. With 14 maps & 1 chart.

The thirty local surveys here summarized (and illustrated by 14 maps) took 20 months, from Sept. 1928 to April 1930. Of 17,246 rodents caught 16,607 were *rattus* and only 294 *norvegicus*, with a few bandicoots, mice, and gerbilles. Of 82,708 fleas examined 59·9 per cent. were *Xenopsylla astia*, 33·5 per cent. *X. cheopis*, and 5·9 per cent. *X. brasiliensis*, most of the remainder (0·7 per cent.) being *Leptopsylla musculi* and *Ceratophyllus nilgeriensis*, both of which were restricted to Ootacamund in the Nilgiri Hills.

X. astia was found everywhere, in many towns it was the only species. *X. cheopis* seemed to have some propensity—not absolute or constant—for a moister and cooler "climate." *X. brasiliensis* was the chief species of places on or close to the Mysore plateaux. *X. astia* is regarded as indigenous, *X. cheopis* as an active invader, but of *X. brasiliensis* the evidence is not conclusive. The authors agree with HIRST and with CRAGG that in S. India plague is mainly caused by *X. cheopis*, it being undoubtedly a more effective carrier than *astia*, and probably more effective than *brasiliensis*. In the areas of their distribution *X. brasiliensis* was almost certainly, and *Ceratophyllus nilgeriensis* was probably, a participant in plague-causation. The authors also agree that *X. cheopis* is helped to spread chiefly by the cotton and grain trades, especially by cotton. They much have to say on the influence of climate on the distribution of fleas in S. India, but nothing very conclusive or impressive. *A. A.*

WALKER (J. Norman), CHENOY (C. F.) & RAO (S. Raghavender). **Rat-Flea Survey of the City of Hyderabad (Deccan).**—*Indian Jl. Med. Res.* 1931. Oct. Vol. 19. No. 2. pp. 657–673. With 2 maps in text.

The survey lasted for a term of 19 months, from Sept. 1929 to March 1931. The combined area of the municipality and its suburbs is about 60 sq. m. with a population of about 375 thousand. The average mean temperature of the locality is 61°F. in December and 105°F. in May, and the average rainfall 31 inches. There is much varied and multifarious trade. The grain-markets were insanitary and were heavily infested with rats. There have been 13 epidemics of plague between the years 1911 and 1931.

Of 115,475 of the trapped rodents and other vermin examined 85,906 were *Rattus rattus*, 28,768 mice, 54 bandicoots, 65 *Gunomys varius* and 682 muskrats. Of 13,746 fleas caught 12,949 were *Xenopsylla cheopis*, 794 were *X. astia*, and the remaining 3 were Ctenocephalus and Ceratophyllus. *A. A.*

i. KOPSTEIN (Felix). **Rats and Ratfleas of Java. A Guide for identifying the Species concerned in the Study of the Epidemiology of Plague.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1931. Vol. 20. Pt. 1. pp. 35–72. With 18 text figs. [Refs. in footnotes.]

ii. ——. Die Ökologie der javanischen Siphonapteren und ihre Bedeutung für die Epidemiologie der Pest. [**Oecology of the Fleas of Java and their Significance in the Epidemiology of Plague.**]—*Ztschr. f. Morphologie u. Ökologie d. Tiere.* 1932. Vol. 24. No. 2. pp. 408–434. [24 refs.]

i. This, as its subtitle implies, is a compilation intended as a guide for identifying the species of rats and rat-fleas concerned in the epidemiology of plague, particularly in Java.

ii. This paper contains much information about *Xenopsylla cheopis*, *X. astia*, *Stivalius cognatus* (=*Pygiopsylla ahalae*), and their local hosts and distribution in Java, and a few remarks on *Neopsylla sondaica* and *Pulex irritans*. It also gives a list of the (twelve) known species of Javan fleas ; a list of the (six) known species of Javan rat and shrew fleas ; and a list of the known hosts of Javan fleas. The authentic species of fleas of Javan houserats and houseshrews are stated to be *X. cheopis*, *X. astia*, *Stivalius cognatus*, and *N. sondaica*. *A. A.*

CARRIÓN (A. L.). **Final Report on a Rat-Flea Survey of San Juan, Porto Rico.**—*Public Health Rep.* 1932. Jan. 22. Vol. 47. No. 4. pp. 193–201. With 5 charts in text.

In this survey of three consecutive years 1,005 live rats were caught, their concentration being greatest at the water front and the residential sections. From about 57 per cent. of the rats a total of 7,145 fleas was obtained, the flea-index being highest at the docks (nearly 4 per rat) and the commercial district (nearly 6 per rat). The rats were 72 per cent. *R. norvegicus* ; 13 per cent. *R. rattus* ; and 15 per cent. *R. alexandrinus*. Five species of fleas were encountered, 98·5 per cent. being *Xenopsylla cheopis*. *A. A.*

CARNES (E. H.). **Rat-Flea Survey of the Port of St. Thomas, Virgin Islands.**—*Public Health Rep.* 1931. Oct. 23. Vol. 46. No. 43. pp. 2558–2562. With 1 chart in text.

Of 312 rats trapped in 12 months (July 1929–June 1930) at Port St. Thomas 309 were *R alexandrinus* and 3 *R. rattus*. Of their 2,113 fleas taken 2,108 were *Xenopsylla cheopis* and 5 cat or dog fleas. Rat-flea index, average 6·7, highest during summer (March-September), varied directly with temperature and rainfall. *A. A.*

MARCANDIER (M.) & PIROT (R.). Etude sur les ectoparasites des rats de Toulon. [**Study of the Ectoparasites of the Rats of Toulon.**]—*Bull. Soc. Path. Exot.* 1932. Mar. 9. Vol. 25. No. 3. pp. 237–244.

A comparative study of 384 rats caught at Toulon, 285 in the warships stationed there, the rest ashore in the town Of the war-ship rats 187 were *rattus* and 98 *decumanus*. On both species *Xenopsylla*

cheopis was far away the predominant flea (index 3·6 for 41 *decumanus* and 2·5 for 76 *rattus*). Some individuals of *X. cheopis* that were caught from *decumanus* were parasitized by larvae of *Protospirura muris.* Another flea common not much on adult rats but among the newborn naked nestlings in the nest was *Ceratophyllus fasciatus.* Three other fleas found, each only once, were *Pulex irritans, Ctenopsylla musculi,* and *Ctenocephalus canis.* The other ectoparasites of war-ship rats were the common rat-louse (*Haematopinus*) and the ratmite *Dermanyssus muris*, the latter—which also attacks man—frequently on the adult rat, but more often in the rat-nest.

Of the Toulon rats caught ashore not a single one was *rattus*—all were *decumanus.* Excepting *Pulex irritans* their fleas were the same as those of the ship rats, but *Ceratophyllus fasciatus* was twice as abundant as *X. cheopis* and nearly twice as abundant as *C. musculi.* Their other ectoparasites were the common Haematopinus, *Laelaps echidninus* and *Dermanyssus muris*—all three abundant—and (found on one occasion) *Laelaps nuttalli.* *A. A.*

LEESON (H. S.). **Methods of Rearing and Maintaining Large Stocks of Fleas and Mosquitoes for Experimental Purposes.**—*Bull. Entom. Res.* 1932. Mar. Vol. 23. Pt. 1. pp. 25–31. With 5 text figs.

Here are minutely described, with explanatory figures, the apparatus and methods of employing them for the continuous breeding and manipulation of fleas and mosquitoes required in the laboratory. The detail cannot be summarized. *A. A.*

RIVNAY (Ezekiel). **Studies in Tropisms of the Bed Bug** *Cimex lectularius* **L.**—*Parasitology.* 1932. Mar. Vol. 24. No. 1. pp. 121–136. With 9 text figs. [20 refs.]

The ingenious and interesting experiments with bedbugs, here fully reported, led the author to the following among other conclusions. Although bedbugs detect heat very slowly, heat is an important factor in stimulating them towards food, and light and atmospheric humidity do not to any great extent influence this reaction, though moulting and also the state of nutrition do interfere with it, and a too high temperature causes a retreat. Bedbugs have a sense of smell; the odour of blood, muscle, subcutaneous tissue, and clean washed skin seemed to have no influence, but the odour of bile repelled and that of liver first attracted and then repelled them, and that of sweat was sometimes repellent and sometimes attractive, the sebaceous contribution (and also cerumen) having the greatest attractive effect. Negative reactions to water counterbalanced positive reactions to heat and odour—the insect shuns water. In a choice between water, sugar solution, chicken broth, and blood serum deprived of haemoglobin, this last "was always the most acceptable and the bugs of all stages gorged themselves with this fluid"; the author thinks this to be evidence of discrimination by taste. The underlying cause for the gregarious habit of bedbugs "seems to be a tendency to be in contact with some object rather than the preference for darkness." *A. A.*

VOLLMER (Ortrud). Kleidermotten als Fresser lebender Zecken. [**Clothes-Moths feeding on Living Ticks.**]—Reprinted from *Ztschr. f. Angewandte Entom.* 1931. June. Vol. 18. No. 1. pp. 161–174. With 4 text figs.

The author (working in the insectary of the department of biology and medical entomology of the Tropical Institute of Hamburg) tells how in a tube containing some filter-paper with eggs and new-hatched larvae of the tick *Ornithodorous moubata* he noticed on the paper some loose threads of web with entangled lumps of faeces and two caterpillars of the clothes-moth (*Tinea biselliella*); how he put the caterpillars into a separate tube, with some filter-paper but without food, and found next day that one of them had half eaten the other (and subsequently continued and completed its development); and how a re-investigation of the original tube led him to suspect that the said caterpillars must have been living before they were noticed on the living eggs and larvae of the tick. Further observations recorded in unremitting detail and at great length convinced him that his inference was right. Two illustrations, one showing part of the cast skin and the faeces of a caterpillar in dangerous proximity to the much-abraded body of an Ornithodorus larva of the 2nd stage; the other a caterpillar embracing the battered body of a fair-size Argas larva, are given to complete the account; but the author often saw a caterpillar and tick larva *flagrante bello.* *A. A.*

ROUBAUD (E.) & COLAS-BELCOUR (J.). Etude sur les Ornithodores, du groupe *lahorensis* dans l'Afrique du Nord. Description d' "O. delanoëi" n. sp. [**On the *Lahorensis* Group of Ornithodorus in North Africa. Description of "*O. delanoei*" n. sp.**]—*Bull. Soc. Path. Exot.* 1931. Dec. 9. Vol. 24. No. 10. pp. 948–957. With 4 text figs. & 3 figs. on 1 plate.

Description with good figures of *O. delanoei*, a new species, taken from porcupine earths in W. Morocco, close akin to *O. foleyi* of Parrot from the Algerian Sahara, and to *O. franchinii* of Rondelli from Italian N. Africa. The three species along with *O. lahorensis* are here regarded as forming a "group." *A. A.*

KRIJGSMAN (B. J.) & PONTO (S. A. S.). Die Verbreitung der Zecken in Niederländisch-Ostindien. [**Distribution of Ticks in the Netherlands East-Indies.**]—*Ztschr. f. Parasitenk.* 1931. Dec. 4. Vol. 4. No. 1. pp. 140–146. With 3 double plates. [23 refs.]

The distribution and the known provenance of the species of ticks inhabiting the Netherlands East Indies is here collated and elegantly mapped. *A. A.*

i. KODAMA (Toshikuni). **On a Certain Mite belonging to Tyroglyphidae found in Human Excreta and its Eggs.**—*Jl. Public Health Assoc. Japan.* 1931. Oct. Vol. 7. No. 10. pp. 1–2.

ii. ——. **On a Certain Mite belonging to Tyroglyphidae found in Human Excreta and its Eggs (Abstract). (Supplement to an Article under Same Heading in the October Number.)**—*Ibid.* 1932. Feb. Vol. 8. No. 2. pp. 5–6.

i. This common foodmite and its eggs were found in the faeces of 6 of 645 school-children and also several times in those of a two-year-old.

Whatever its species it is said that its eggs could hatch after soaking for more than a fortnight in 10 per cent. formalin solution, the larvae sometimes living for a few hours afterwards.

ii. In this supplementary note it is stated that the same mite and its eggs have been detected in the faeces of 25 out of about 2,000 factory hands examined ; also that the female mites are still living and producing eggs after 83 days in a suspension of faeces. *A. A.*

BONNET (P.). Quelques renseignements sur la biologie de *Lebistes reticulatus* Peters, poissons larvivores de la Guadeloupe. [**Notes on the Biology of** *Lebistes reticulatus* **Larvivorous Fishes of Guadeloupe.**]—*Bull. Soc. Path. Exot.* 1932. Mar. 9. Vol. 25. No. 3. pp. 248–251.

Lebistes reticulatus is a West Indian species of Cyprinodont fishes commonly known as " millions." The present author observing it in Guadeloupe, states that it can live both in running water and in stagnant water fearfully polluted with organic matter, and even in old salt-works, feeding at the surface but not in deep water. [In these respects it is far from singular among the Cyprinodont fishes.]

A. A.

COULON (G.) & SAUTET (J.). *Gambusia holbrooki* et paludisme en Corse. Résultats de six années de lutte antilarvaire au moyen des poissons culiciphages. [*Gambusia holbrooki* **and Malaria in Corsica. Results of Six Years Antilarva Work.**]—*Ann. Parasit. Humaine et Comparée.* 1931. Nov. 1. Vol. 9. No. 6. pp. 530–545. With 8 text figs.

An account (covering six years) of the results of the introduction of the Cyprinodont fish *Gambusia holbrooki* into Corsica for the control of malaria-mosquitoes. [The fish is a typical Cyprinodont in its equal aptitude for waters that are fresh, or salt, or polluted]. In the fresh waters of Corsica its only possible fish-enemies are trout, eel, and blenny, and among other possible foes a Dytiscus beetle, a Notonectes bug, a water leech and the frog have been observed ; but none of them prevail against it. In brackish waters communicating with the sea it is pursued by the sea-bass [a perciform fish] and its numbers reduced. But in general it may be said to find in the littoral region and in the low valleys of Corsica conditions extremely favourable for its existence. Of the anti-larval value of Gambusia in various places in Corsica this paper gives remarkable testimony ; " but has paludism regressed in the regions that have benefited so much by the anti-larval prowess " is a question to which " unfortunately it is impossible to give a precise answer."

In introducing Gambusia all waters should be stocked, and be re-stocked again and again if necessary, especially in autumn or in early spring in the case of mosquito-waters that have evaporated unduly in the summer. In the spring time also such waters should be treated with Paris green or with petroleum which are not hurtful to the fish. *A. A.*

GUDGER (E. W.). **On the Alleged Penetration of the Human Urethra by an Amazonian Catfish called Candiru with a Review of the Allied Habits of Other Members of the Family Pygidiidae. Parts I & II.**—*Amer. Jl. Surgery.* 1930. Jan. & Feb. Vol. 8. Nos. 1 & 2. pp. 170–188 ; 443–457. With 17 text figs. [41 refs.]

This is a long and interesting story about the small catfishes of the Amazon and its tributaries called *candiru* by the Indians and *canero* by others [and briefly attended to in modern text-books of zoology as "Stegophilus and Vandellia, small fishes from Brazil, the latter are said to ascend the urethra of persons bathing ; but there is no doubt that they enter the gill-cavity of larger fishes]. The story begins about a hundred years ago, and those who wish to follow it should read this paper It opens with MARTINS (1829 and 1831) and the statement that " the things told of this [*candiru*] sound so unusual that I myself am almost afraid to relate them."

The things told by the Indians were that this *candiru* is strangely attracted by the smell of human secretions, and particularly of urine and will enter " with great impetuosity and rapidity " the natural gates and alleys of the perineal region of men and women bathers in the river—even the urethra of the male where it may attach itself and may lead to most painful and dangerous accidents in attempts at its extraction. So real is their fear of the *candiru* that when bathing in the river the Indians take very good care not to pass water, the men ligaturing the prepuce. These Indian stories were confirmed by Dr. LACERDA, a well known naturalist and physician of the day, in Pará. Such is the gist of the story, which from the verified reality of the native bathers' fear and their lively concern in protecting the threatened parts of the body, one cannot treat with contempt. One great difficulty in investigation is that there are many aquatic things besides mysterious fishes that may injure bathers, and in Amazon waters there are certain specific fishes small as well as large that are notorious for their bold ferocity in attacking men and even horses ; moreover one of these large fishes is spoken of as *candiru da cavallo* ; mutilations and scars well-attested to be due to such rapacious fishes must be distinguished from the insinuating operations of the *candiru*.

We may take to begin with the first-hand observations and experience of those who have seen a *candiru* (or *canero*) taken from one of the privy passages. POEPPING himself (circ. 1836) witnessed a case where penetration of the vagina by a *canero* caused such frightful pain and loss of blood that the woman was " given up to die." Dr. CASTRO of Pará (quoted by JOBERT) wrote " I have myself extracted from the urethra of a negress a little *candiru* which had penetrated during micturition, while bathing in the river ; the patient experienced cruel suffering since I had to drag the animal out," with difficulty and laceration. LA COINTE of Pará had personal knowledge of three cases of penetration of the natural openings by a *candiru*, and he describes a vaginal case treated by him and the difficulties and haemorrhage of extraction. Dr. DA MATTA of Manaos describes another vaginal case. Dr. AMMERMAN, U.S.N., testifies that when on the Madeira river he operated two or three times for *candiru*, and that in one male case the fish had penetrated by way of the urethra into the bladder whence it was extracted by suprapubic cystotomy. Besides this ocular testimony there is the statement of Dr. CAMPOS of Pará that he had a lady patient who told him that she had suffered from the extraction of a *candiru* from the vagina ; and that of PEARSON who was told by a friend that

his wife when washing in a river had heard the sudden shrieks of a companion assaulted by a *candiru* and had witnessed the painful difficulty and the haemorrhage of its extraction. Such is the positive evidence, given mainly by medical men, and it supports the Indians' story. What has to be noticed about this evidence is the secrecy of the candiru's attack, the facts that it goes for definite openings in a particular region of the body and sticks very fast where it lodges, and the inordinate haemorrhage attending its removal.

Indian stories that the small Pygidoid catfishes known as *candirus* may enter the male urethra and may even get into the male bladder, as well as into the urinogenital passages of the female, with something that looks remarkably like intention, receive support from the circumstantial evidence collected by the author. This evidence shows that in this section of the catfish family there are some truly endoparasitic species that live in the gill-chambers of large fishes and feed on their blood, other species that burrow through the body-wall of large fishes for the same purpose, and still other species that firmly attach themselves temporarily to other fishes (or to other aquatic animals) for their fill. These ectoparasitic and truly endoparasitic Pygidioid catfishes have certain common features, namely combs or patches of retrorse spines on the gill-covers to act as grapnels, and a suctorial mouth with teeth formed and arranged for scarification—all this being apparatus for holding fast and for drawing and sucking blood—also a somewhat elongate and slender body and a short straight stomach and gut. It is among these endoparasitic and ectoparasitic and casually parasitic Pygidioid kindred that the author, following EIGENMANN, seems inclined to locate the *candiru*; [but whether he would refer them to any known parasitic species, or would think that some of Nature's journeymen had made them for such, and not made them well, is not yet *quite* clear.] *A. A.*

BAKER (C. E.). **Microscopic Examination for Intestinal Parasites of 73 Boys in the National Training School for Boys, Washington, D.C.**—*Public Health Rep.* 1931. Dec. 11. Vol. 46. No. 50. pp. 2980–2983.

Examination of 73 boys in the National Training School, Washington, They came from 17 different States, mostly from Southern States. Fifty-six were infested; only those from California (1) and Colombia (2) were free; 24 infestations were simple, 18 double, 7 triple, 5 quadruple, 1 quintuple, 1 six-fold. An entamoeba cyst was found under the nail of a boy employed in the kitchen of an officers' mess. The parasites found were *E. coli* in 25, *E. histolytica* in 6, *Endolimax nana* in 16, *Iodamoeba williamsi* in 1, unidentified cysts in 2, *Chilomastix mesnili* in 3, *Giardia lamblia* in 11, *Hymenolepis nana* in 7, *Necator americanus* in 25, *Ascaris lumbricoides* in 3, *Trichuris trichiura* in 10, *Strongyloides stercoralis* in 2, ovum of free nematode in 1. *A. A.*

ARTHUS (Maurice). Les anavenins. (Cinquième Mémoire.) 1. Equivalence des venins et des anavenins. 2. Amphibolie. [**Anavenins. (Fifth Memoir.) 1. Equivalence of Venoms and Anavenins. 2. Amphiboly.**]—*Jl. Physiol. et Path. Gén.* 1931. Sept. Vol. 29. No. 3. pp. 462–477.

[For notice of the author's earlier papers on this subject see this *Bulletin* Vol. 28, pp. 549, 550, and Vol. 29, p. 161. This seems to be the philosophic conclusion, or distillation, of this very interesting series.]

Venoms and their corresponding antivenins, equally effectual in provoking and perfecting immunity in rabbits, are equally effectual in producing in that animal a state of anaphylaxy and in inciting equally intense anaphylactic crises in the anaphylactised animal. In effect, animals that have undergone the process of immunization against a venom are at one and the same time immunized to the specific toxic effects and anaphylactized to the proteo-toxic effects. This state of anaphylaxy-immunity the author names amphiboly [αμφίβολος= hitting both-ways]. In this state of amphiboly immunity is signalized in the magnified minimum lethal dose of the venom, and anaphylaxy is indicated by the exaggerated sensibility to the proteo-toxins. Antivenomous serums are thus amphibolistic serums apt to excite passive amphiboly in animals into which they are injected; they are thus in the very likeness of the animals by which they are equipped.

A. A.

KOPSTEIN (Felix). *Bungarus javanicus*, een nieuwe Javaansche giftslang. Mededeeling over een doodelijke Bungarus beet. [*Bungarus javanicus*, **a New Species of Poisonous Snake in Java. A Fatal Case of its Bite.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1932. Feb. 2. Vol. 72. No. 3. pp. 136–139. With 1 plate & 1 text fig.

Two men, bitten by the snake in question, died respectively within half-an-hour and within 16 hours after the bite, the most prominent symptom apparently being dyspnoea.

The snake is a hitherto undescribed species, labelled by the author *Bungarus javanicus*. The back is bluish black with numerous gray white spots. The ventral side is more or less white, the abdominal shields with dark corners. *W. J. Bais.*

SPENCER (H. A.). **Scorpion and Insect Stings.**—*South African Med. Jl.* 1932. Mar. 12. Vol. 6. No. 5. pp. 157–158.

The author has found the old-established local application of solution of ammonia or of borax to give immediate relief to the pain caused by stings of scorpions, hornets, bees, etc. *A. A.*

WIGGLESWORTH (V. B.). **Haematin in the Tracheae of Blood-sucking Insects: an Artefact.**—*Parasitology.* 1931. Nov. Vol. 23. No. 4. pp. 441–442.

"The entry of blood pigment into the tracheal system after a large meal, previously described in *Glossina*, has been shown to be an artefact of fixation." *A. A.*

EPSTEIN (B.). Scorpion Stings.—*Jl. Med. Assoc. South Africa.* 1931. Dec. 12. Vol. 5. No. 23. pp. 784–785.

EVANS (A. M.). A New Subspecies of *Anopheles funestus* Giles, from Southern Rhodesia.—*Ann. Trop. Med. & Parasit.* 1931. Dec. 31. Vol. 25. Nos. 3 & 4. pp. 545–549.

HASE (Albrecht). Ueber Lebensbedingungen, Verhalten und Fruchtbarkeit der tropischen Hauswanze *Cimex rotundatus* Sign. (*Hex. Rhynch.*) in Venezuela. Beiträge zur experimentellen Parasitologie 7.—*Ztschr. f. Parasitenk.* 1931. Aug. 28. Vol. 3. No. 4. pp. 837–893. With 11 text figs. [3 pages of refs.]

LALLEMANT (G. F. H. Avé), SOERONO (M.) & SOEKARIA (M. S.). Experiments about the Flying Radius of Some Anopheles. (First Communication.)—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1931. Vol. 20. Pt. 1. pp. 12–25. With 1 map & 1 graph. [11 refs.]

MARTINI (E.). Die Rassenfrage bei *Anopheles maculipennis.* Ein kritisches Sammelreferat.—*Arch. f. Schiffs- u. Trop. Hyg.* 1931. Dec. Vol. 35. No. 12. pp. 707–733. [5 pages of refs.]

MILELLA (Alberto). Protozoi intestinali patogeni nelle Puglie.—*Pathologica.* 1932. Mar. 15. Vol. 24. No. 485. pp. 184–185. [13 refs.] English summary (8 lines).

OBITZ (Kurt). Ueber die Fütterungsinfektion wilder Ratten (*Mus decumanus* Pall.) mit *Balantidium coli*-Cysten vom Schweine.—*Ztschr. f. Parasitenk.* 1931. Aug. 28. Vol. 3. No. 4. pp. 649–653.

SALEM (Hassan Hilmy). Some Observations on the Structure of the Mouth Parts and Fore-Intestine of the Fourth Stage Larva of *Aedes* (*Stegomyia*) *fasciata* (Fab.).—*Ann. Trop. Med. & Parasit.* 1931. Dec. 31. Vol. 25. Nos. 3 & 4. pp. 393–419. With 14 text figs. [22 refs.]

SOESILO (R.) & VAN SLOOTEN (J.). Miscellaneous Notes on Anopheline Mosquitoes in the Dutch East Indies.—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1931. Vol. 20. Pt. 2. pp. 124–128. With 7 text figs.

TANABE (Misao) & KUWABARA (Naonori). Studies on the Growth of *Entamoeba coli* in Vitro.—*Keijo Jl. of Med.* 1931. June 30. Vol. 2. No. 2. pp. 35–43 (199–207). [12 refs.]

TOUMANOFF (C.) & FARINAUD (E.). Note sur une prospection entomologique à Chapa. Présence de deux espèces anophéliennes jusqu'ici méconnues en Indochine: *T. Lindesaii* Giles et *A. Gigas* var. *baileyi* Edw.—*Bull. Soc. Path. Exot.* 1932. Mar. 9. Vol. 25. No. 3. pp. 245–247.

VELLARD (J.) & VIANNA (M. Miguelote). Acção hemolytica dos principaes venenos ophidicos em presença de soros normaes.—*Rev. Med.-Cirurg. do Brasil.* 1931. Sept. Vol. 39. No. 9. pp. 293–329; 1932. Jan. Vol. 40. No. 1. pp. 11–27.

WALTER (Elizabeth). Protozoos y gusanos intestinales en la poblacion infantil de Torrelavega (Santander).—*Medicina Países Cálidos.* Madrid. 1931. Nov. Vol. 4. No. 6. pp. 502–514. With 1 text fig.

KALA AZAR.

NAPIER (L. Everard) & KRISHNAN (K. V.). **A Theory of the Aetiology and Epidemiology of Kala-Azar in India.**—*Indian Med. Gaz.* 1931. Nov. Vol. 66. No. 11. pp. 603–609. With 1 graph in text. [36 refs.]

In this article the authors introduce a new theory of the epidemiology of kala azar in India which has arisen from the fact that dermal infections with the parasite of the disease are common and probably increasing in Bengal, while they are rare in Assam. The explanation is that in Assam the disease occurs in acute form in epidemic waves, the population losing in the intervening periods any immunity it may have acquired, while in Bengal the disease has been present for many years in endemic form maintaining in the inhabitants a steady immunity which tends to eradicate any visceral invasion of the parasite. It is assumed that in both places the parasite is introduced into the skin, presumably by the sand-fly, and finds there a nidus of reticulo-endothelial cells in which to multiply secure from any serious immunological interference. The onset of some disease, such as malaria or typhoid fever, brings about a mobilization of the infected large mononuclear cells with the consequent distribution of parasites throughout the viscera and other parts of the skin. Where there is no immunity, as in Assam, kala azar results, whereas in Bengal the visceral infection will in many cases fail to become established or be kept in abeyance. The parasites distributed throughout the skin in Bengal ultimately produce cutaneous lesions, but in Assam the visceral infection kills its victim. In addition it is assumed that in Bengal the parasite has become more adapted to a cutaneous habitat and when taken up by the sand-fly from the skin will, when injected, survive more readily in the skin than in the viscera, the converse being the case in Assam where the sand-fly ingests the visceral parasites which appear in the circulating blood and which when reinjected by the sand-fly are more adapted to a survival in the viscera. In Assam the parasite has not undergone the evolutionary development and in consequence dermal lesions are uncommon.

The authors do not discuss the effect of treatment in Assam and Bengal save to remark that they believe that treatment only acts by stimulating immunity response. It is well known that in Bengal cases of kala azar occur and are cured by treatment of their visceral infections, but not always of the cutaneous ones, for not infrequently generalized skin lesions due to the parasite appear a year or two later. The same treatment cures visceral infections in Assam yet subsequent cutaneous lesions do not occur. In both cases the authors assume that the parasites when first introduced remain at a single focus in the skin and are distributed by what they term the mobilization of large mononuclears brought about by some other infection. Are we to assume that in Assam the parasites distributed to the skin by this mobilization do not survive as they do in Bengal, or that they are more readily destroyed by treatment? If in Assam the parasites are able to survive locally in the skin when first introduced why not after their general distribution? Their answer appears to be that in Assam the immunity response on the part of the host is greater than in Bengal. The theory is undoubtedly a very interesting one and is clearly discussed, the evidence supporting each statement being given in a series of footnotes. *C. M. Wenyon.*

WENYON (C. M.). **The Transmission of Leishmania Infections. A Review.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1932. Mar. 31. Vol. 25. No. 5. pp. 319–348. With 3 figs. [137 refs.]

Dr. Wenyon writes a full and clear review of this in some ways perplexing subject which he unravels as far as is at the moment possible.

He considers direct infection, concluding that the flagellate stage of leishmania can have no satisfactory explanation except in association with some insect or other invertebrate ; the bed bug theory ; the dog tick theory ; the flea theory ; and lastly the sandfly theory ; and concludes as follows :—

" All the experiments described above have been attempts to transmit kala-azar or oriental sore by the bite of infected sandflies and it must be admitted that the hopes raised by the discovery of the remarkable development of leishmania in sandflies have not been realised. It was supposed that given a susceptible animal transmission by the bite would be easily accomplished. This has not been the case, so that if the theory of sandfly transmission of these diseases is not to be abandoned, which it seems unreasonable to do, it has to be assumed that some fundamental factor in all these experiments has been omitted or that infection may take place otherwise than by the bite. ADLER (1929), in an analysis of the leishmania sandfly problem, lays stress on the fact that in the Mediterranean area very young children and dogs suffer from kala-azar whereas in India and North China human beings who contract the disease are generally older while dogs are not infected. He sees in this an indication that in India and North China infection may be acquired by the crushing of infected sandflies on the skin whereas in the Mediterranean area the method of infection is by the bite, as very young children and dogs are unlikely to crush these insects. Similarly in Bagdad human beings and dogs commonly suffer from oriental sore while in Palestine infection in dogs does not occur. The inference is that in Bagdad infection is by the bite and in Palestine by crushing. In support of this it is stated that the development of *L. tropica* is more marked in *P. sergenti* of Bagdad than in *P. papatasi* of Palestine. KNOWLES (1927) has suggested that in endemic areas in India there may be very extensive inoculation of the population with leishmania by the sandfly but that in only certain cases of lowered resistance will infection take place, as for instance after typhoid fever or malaria. Whatever may be the explanation of the difficulties encountered in effecting transmission by the sandfly, there is abundant evidence, apart from the specific development of the parasite in these insects, that they are associated with the diseases. In India it was SINTON's observation that the distribution of *P. argentipes* in India coincided with that of kala-azar that led KNOWLES, NAPIER and SMITH to make the outstanding discovery in connection with its transmission. NAPIER (1925) in a study of environment associated with kala-azar in Calcutta concluded that the evidence was in favour of the sandfly being the transmitter of the disease, while more recently the same observer (1931) in an epidemiological investigation of kala-azar in a rural area in Bengal found that all the data secured fitted into the hypothesis that *P. argentipes* was the vector. In North China again kala-azar is limited almost entirely to areas north of the Yangtse and nothing is known of sandflies south of this river. MORRIS (1931) has reported one case from Sungkiang fifteen miles south west of Shanghai. ADLER and THEODOR (1931*b*) point out that in Italy the distribution of *P. perniciosus* and kala-azar are identical. In Catania it is significant that both this sandfly and kala-azar are rare at the centre of the town while the absence of the sandfly and kala-azar above a certain altitude even in the centre of endemic foci is in favour of this particular species being the vector. As regards oriental sore wherever it occurs sandflies are common though it cannot be asserted that the converse is true. Epidemiological evidence such as this could be multiplied but though much of it does not

definitely incriminate the sandfly in no case can it be said to have refuted the theory of sandfly transmission.

"It may be that infection results from the ingestion of infected sandflies or the crushing of them on the skin but neither of these methods would account for the anterior development, which is much more suggestive of infection through the bite. In the light of NAPIER and KRISHNAN'S (1931) statements regarding dermal leishmaniasis in Bengal it seems possible that in kala-azar, as also in oriental sore, a primary local skin infection, perhaps not detectable, may be produced by the bite of an infected sandfly and that in only certain cases or when the parasite is particularly virulent is natural kala-azar produced by generalisation of the infection. ROW (1912) proved that in the monkey a purely local lesion might result from the inoculation of *L. donovani* in the skin, while KORKE (1914) confirmed this observation but pointed out that in some cases a generalised infection might result and in others both a local lesion and a generalised infection. SHORTT and SWAMINATH (1926) inoculated a monkey intradermally with *L. donovani* and discovered parasites in the internal organs one year later.

"It is evident that the problem has not yet been completely solved but the fact that in one or two cases transmission by the bite of the sandfly has been effected, that there is undoubtedly a specific relationship between leishmania and these insects in the light of the remarkable development that takes place, that the flagellates in the sandfly are virulent and are known to escape from the proboscis during feeding, afford overwhelming evidence that sandflies are responsible for the spread of the two diseases kala-azar and oriental sore."

A list of 137 references is appended. *A. G. B.*

MORRIS (H. H.). **Kala-Azar from Southern Kiangsu.**—*China Med. Jl.* 1931. Dec. Vol. 45. No. 12. pp. 1180–1181.

The case reported is of interest in that the patient made repeated statements that he had never been more than a few miles from Sungkiang, a small town on the Hangchow-Shanghai Railway, some fifteen miles south-west of Shanghai. Thus, for the first time, extending the area of kala azar in China to a district south of the Yangtse.

C. M. W.

CANAAN (T.). Ein kasuistisch-geographischer Beitrag zur Kala-azar. [**K.A. : Distribution.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1931. Dec. Vol 35. No. 12. pp. 706–707.

The author records the first case of kala azar from Palestine in a child 4½ years of age who had always lived in the Mohammedan village of Beit Iksa, north-west of Jerusalem. *C. M. W.*

DE LA CAMARA (Pedro). Leishmaniosis y *Phlebotomus*. [**Leishmaniasis and Phlebotomus.**]—*Medicina Países Cálidos*. Madrid. 1932. Mar. Vol. 5. No. 2. pp. 81–123. With 8 text figs. [150 refs.] French summary.

The paper is a lengthy discussion of published work on the question of the transmission of leishmaniasis by blood-sucking arthropoda, chiefly sandflies. A list of 150 references is given. *C. M. W.*

BROC. La rate dans le kala-azar de la première enfance. [**The Spleen in K.A. of Young Children.**]—*Tunisie Méd.* 1931. Sept.-Oct. Vol. 25. No. 8. pp. 432–434.

That marked enlargement of the spleen does not always occur in kala azar is illustrated by the author in reference to five cases in young children in which the spleen, even in an advanced stage of the disease, did not extend below the costal margin for more than one to two fingers' breadth. Since in Tunis this degree of enlargement due to other causes is of common occurrence, errors in diagnosis are liable to occur, as in one of the cases reported in which the nature of the illness was not realised till it was too late for treatment. It is evident that in endemic centres of kala azar a febrile anaemia associated with a moderate enlargement of the spleen which does not respond to quinine should be regarded as possibly due to kala azar. *C. M. W.*

SALA GINABREDA (José M.). El valor pronóstico de la punción del bazo en el kala-azar. [**Prognostic Value of Spleen Puncture in K.A.**] —*Rev. Méd. Barcelona.* 1932. Mar. Vol. 17. No. 99. pp. 205–218. With 10 charts. [13 refs.]

The view is expressed that in cases of kala azar the appearance of the films made from blood obtained by spleen puncture affords some indication of the severity of the case. In some cases the films resemble those from splenomegaly of a benign type. The leucocytes are reduced in number, there being one to each hundred or two hundred red blood corpuscles. Of the leucocytes present, the majority are lymphocytes or mononuclears, the monocytes being scanty. Few leishmania are present. Such cases are benign in nature, respond rapidly to treatment and are not subject to complications. In other cases the films show numerous parasites and an intense leucocytosis with abundant monocytes. In these cases complications are frequent and the prognosis is bad. *C. M. W.*

CORONA (Franco). Nuovo contributo allo studio del kala-azar dell' adulto. [**Kala Azar in the Adult.**]—*Riforma Med.* 1931. Nov. 16. Vol. 47. No. 46. pp. 1735–1739.

The author, after reviewing the previous records of cases of kala azar in adults in Italy including eight cases reported by himself from Palermo during the three years 1927–1929, describes in detail four further cases in individuals varying in age from 15 to 27, which have since come to his notice in the same province. *C. M. W.*

OELSNITZ & LIOTARD (M.). Le diagnostic et le traitement de la leishmaniose viscérale. A propos d'un cas de kala-azar méditerranéen de l'adulte suivi de guérison. [**Case of K.A. in Adult : Recovery.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1932. Feb. 8. 48th Year. 3rd Ser. No. 4. pp. 126–141. With 2 text figs. [Refs. in footnotes.]

A detailed account of a case of kala azar in an adult and its successful treatment in the South of France. Two other cases, both fatal, seen by the authors in adults in France are mentioned, but it is not clear in any one where the disease was contracted, though if not in the South of France a very long history has to be admitted. *C. M. W.*

ABRAMI (P.), GRÉGOIRE & WALLICH (Robert). Un cas de kala-azar autochtone de l'adulte : splénectomie, guérison. [**Case of K. A. in an Adult.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1931. Nov. 30. 47th Year. 3rd Ser. No. 32. pp. 1783–1787.

A woman, thirty-five years of age, who for the past ten years had been in no countries but France, England and Germany, was, after long delay in diagnosis owing to a previous history of malaria, discovered to be suffering from kala azar. It is concluded that the disease was contracted in France, the Mediterranean littoral of which is known to be an endemic area. Owing to the advanced stage of the disease, splenectomy was performed and on the following day 10 centigrams of stibenyl were administered. This was followed by a course of neostibosan consisting of two doses of 0·2 gm. and eight doses of 0·3 gm. given on alternate days. Though the leucocyte count had returned to normal within eighteen days of the operation, the patient remained very anaemic in spite of treatment with liver extract and a diet rich in vitamins. Accordingly on the nineteenth day 200 cc. of blood were transfused. From this time improvement was continuous. About a month later a supplementary course of ten doses of neostibosan was given. A complete recovery resulted. *C. M. W.*

HERRERO RUBIO (Pedro). Tres casos de gran esplenomegalia infantil relacionados con leishmaniosis ; efectos del neoestibosan en el tratamiento. [**Three Cases of Infantile Splenomegaly, One due to Leishmaniasis.**]—*Medicina Países Cálidos.* Madrid. 1932. Mar. Vol. 5. No. 2. pp. 154–162. With 3 text figs.

The author describes three cases of splenomegaly in young children of Alicante in Spain. Spleen puncture revealed leishmania in one of them only, but all three were treated with neostibosan. The case in which leishmania had been found and one of the others improved with treatment and were clinically cured but the other case did not respond, the conclusion being finally reached that it was some form of malignant tumour. *C. M. W.*

MARQUÉZY (R. A.), MONNIER & BORRIEN (H.). Un cas de kala-azar infantile observé dans la région parisienne. Guérison depuis cinq ans. Remarques sur la durée de l'incubation. [**Case of K.A. seen 5 Years after Recovery.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1931. Dec. 14. 47th Year. 3rd Ser. No. 34. pp. 1862–1865.

A record of a case of kala azar in a young boy seen by the authors in 1926 in Paris. The disease was contracted either at La Napoule or Grasse in the South of France. Treatment occupying three months was carried out with intravenous tartar emetic and stibyal, and later by intramuscular injections of stibenyl. A complete cure resulted, the child having remained in good health. *C. M. W.*

CHAHED (Laroussi). Un cas de kala-azar chez un enfant musulman. [**K.A. in a Mussulman Child.**]—*Tunisie Méd.* 1931. Sept.-Oct. Vol. 25. No. 8. pp. 435–436. With 1 chart in text.

Record of a fatal case of kala-azar in an Arab child in Tunis, in which diagnosis was made only after death. *C. M. W.*

i. RUGGERO & SANTILLANA. Un cas de kala-azar antimonio-résistant. [**Treatment of K.A.**]—*Tunisie Méd.* 1931. Sept.-Oct. Vol. 25. No. 8. pp. 426–427.

ii. BROC. Le traitement du kala-azar par le néostibosane.—*Ibid.* pp. 428–431.

i. The record of a case of kala azar in a female child three years of age which has proved resistant to intravenous tartar emetic, intramuscular neostibosan and tartar emetic again. In spite of this treatment the condition is becoming progressively worse.

ii. A record of the treatment of four cases of infantile kala azar by intramuscular injections of neostibosan. Two of the cases made a good recovery but two which were too far advanced died. *C. M. W.*

NAPIER (L. Everard). **The Pentavalent Compounds of Antimony in the Treatment of Kala-Azar. Part VI. A Comparison of Results with Different Compounds. Part VII. Neostibosan : Di-Ethyl-Amine Para-Amino-Phenyl Stibiate ; 254 Cases.**—*Indian Jl. Med. Res.* 1932. Jan. Vol. 19. No. 3. pp. 705–717. With 1 graph in text. [8 refs.]; pp. 719–735. With 2 graphs in text.

During the period 1923 to 1926 five important pentavalent antimony compounds, viz. Stibosan, Bayer 693 (Neostibosan), Aminostiburea, Urea stibamine and Stibamine glucoside, have been used at the Calcutta School of Tropical Medicine for the treatment of kala azar. The results obtained with each drug have already been given in a series of papers (Parts I-V). The object of the present paper (Part VI) is to compare these results with a view to deciding which of the five drugs is the best. The many difficulties associated with such a comparison are indicated and carefully discussed in the paper. As regards cure it is revealed that the only reliable criterion is a history of at least six months' good health after completion of a course of treatment. It appears now that deaths which occurred during treatment are in a sense attributable to the drug in that they would not have occurred so soon if treatment had been withheld. This is especially the case with tartar emetic but though with the pentavalent compounds deaths during treatment are fewer, they have to be taken into account in assessing the value of a drug for they vary with the drug used. Thus, of 104 persons treated with stibosan 11 died during treatment but of 61 treated with neostibosan none died. Other points which are considered are cessation of fever, reduction in the size of the spleen, increase in weight and change in white cell count. The general result arrived at is that the drug Bayer 693 had the highest curative power and was the most suitable for further detailed investigations.

The second paper (Part VII) gives the results of these further investigations with Bayer 693. It is noted that the early batches of the drug were different from the last, which was prepared by a modified process owing to the author's information to the I.G. that the early batches sometimes caused vomiting. The last batch was named Bayer 693 B. Though differing slightly in antimony content from the early batches its therapeutic effect appeared to be the same without, however, the production of vomiting. Up to the end of 1928 a series of 254 cases had been treated with one or other of these batches. Examination of the results shows that where large numbers of patients are to be treated actual total doses of 2·25 gm. or relative total doses of 3·0 gm. per kilo

of body weight are the most suitable. To give more would be uneconomical and to give less would mean a distinct increase in the relapse rate. The intravenous injection of 5 per cent. solution would appear to be the method of choice, but there seems to be no reason why a 25 per cent. solution should not be used intravenously or even intramuscularly. As regards the distribution of doses there is no clear indication, but there would appear to be no disadvantage in giving injections daily. It is possible that a course of daily injections for five days (the 5-injection course) may prove to be the most satisfactory, but further evidence on this point is required. To appreciate properly the difficulties of an analysis of the kind given in these papers it is necessary to study them in detail. *C. M. W.*

LOW (G. Carmichael) & FRANKLIN (R. H.). **New Antimony Preparations in the Treatment of Mediterranean Leishmaniasis and Japanese (or Eastern) Schistosomiasis.**—*Lancet.* 1932. Feb. 20. pp. 395–396.

The first case described is that of a female child three and a half years of age who contracted kala azar in Malta. Treatment with von Heyden 471 (Stibosan) intramuscularly was commenced with a dose of 0·025 gm. Injections were given on alternate days, the dose being increased to 0·05 gm. and then to 0·075 gm. Improvement was not satisfactory and when a total of 0·625 gm. had been administered neo-stibosan intravenously was substituted. The dose was 0·075 gm. given at first on alternate days, and later on every third day. There was immediate response, improvement being striking and rapid. A total of 0·8 gm. was given. The child was discharged cured, and four months later was in good health. The second case reported is that of a man of 29 years suffering from Japanese schistosomiasis. Ten intramuscular injections of neo-antimosan (Fouadin) were given (1 dose of 1·5 cc.; 1 of 3·5 cc.; and 8 of 5 cc.) in the course of thirteen days. A complete cure resulted. *C. M. W.*

DIKSHIT (B. B.) & RAO (D. Kameshwar). **Antimony Test for Kala-Azar.**—*Indian Jl. Med.* 1931. Dec. Vol. 12. No. 6. pp. 264–267.

When the antimony test for kala azar was described by CHOPRA and his colleagues it was stated that 97 per cent. of kala azar sera gave a positive result and that sera from cases of other diseases were usually negative. As in these tests the control sera were taken from cases in the endemic kala azar area, the authors of the paper under review tested the sera of 100 cases in a non-endemic area. The result was negative in all but 4, one of which proved to be kala azar. Two of the three remaining were cases of pyrexia of short duration, and one a case of dog bite showing no clinical manifestations of rabies. *C. M. W.*

SEN (N. K.). **The Antimony Test with Sera other than those of Kala-Azar.**—*Malayan Med. Jl.* 1932. Mar. Vol. 7. No. 1. pp. 13–15.

During the year 1931 four cases of kala azar and one of dermal leishmanoid were admitted to the Singapore hospitals. All these cases gave histories of infection outside Malaya—India, China, Malta. As the sera of these cases gave a positive antimony test it was decided to

apply the test to a number of other sera which were available for the Kahn test. The test was carried out by running in to the sera in Dreyer's tubes a 4 per cent. solution of neostibosan in distilled water. Readings were taken in 5 to 10 minutes. If the reaction was positive or doubtfully positive the test was repeated with serum diluted 1 in 10. Of 1,000 undiluted sera tested 7 gave a positive result and 36 a doubtful one. Of the positive sera 6 were still positive on dilution, while of the 36 doubtful ones all but two were completely negative on dilution. There was no relation between the Kahn positive sera and those positive to the antimony test. *C. M. W.*

ANDRE (Z.). **Use of the Photometer "Vernes-Bricq-Yvon" for avoiding Some Causes of Error in the Diagnosis of "Kala-Azar" by the Reaction of Chopra and Gupta's Precipitation.**—*Indian Jl. Med.* 1932. Feb. Vol. 13. Pt. 1. pp. 5–6.

By using the "Vernes-Bricq-Yvon" photometer, the author has found that it is possible to detect the opalescence produced in kala azar serum by the addition of urea stibamine, as in the Chopra and Gupta test when the serum is diluted to 1 in 1,000. Even in this dilution serum from cases of other diseases (1 leprosy, 1 chronic rheumatism) may reveal a slight opalescence. However, if with serum of this dilution an increase of optic density greater than 15° is obtained it can be assumed that the patient is suffering from kala azar. The test is carried out by introducing into each of two tubes 1 cc. of the diluted serum and adding to one tube 0·1 cc. of a 1 per cent. solution of urea stibamine. *C. M. W.*

SALLE (A. J.). **The Metabolism of Protozoa. II. A New Solid and a New Liquid Medium for the Cultivation of *Leishmania donovani*. III. The Metabolism of *Leishmania donovani*.**—*Jl. Infect. Dis.* 1931. Dec. Vol. 49. No. 6. pp. 473–480. [18 refs.]; 481–484. [13 refs.]

With a view to studying the metabolism of *Leishmania donovani* in culture media, experiments were first made to discover the media in which the parasites would grow best. As a solid medium the following was found to yield massive quantities of organisms for inoculation into liquid media and for the preparation of immune sera.

Peptone (Difco) 20 gm., beef infusion 250 cc., salt 5 gm., agar 15 gm. and distilled water to make 830 cc. are boiled to dissolve the agar. Water is added to replace loss by evaporation, and the reaction is adjusted to pH 7·2. The agar base is distributed into flasks (83 cc. to each flask) and sterilized in the autoclave. When required, to one flask is added 2 cc. of sterile 50 per cent. dextrose solution and the agar is melted. When cooled to 50°C. 15 cc. of defibrinated rabbit blood is added and the mixture distributed in test tubes to solidify as slopes. On the surface of this medium in five or six days at 22°C. massive quantities of organisms are obtained. The liquid medium is composed of peptone 20 gm., beef infusion 250 cc., salt 5 gm., dextrose 10 gm. and distilled water to make 550 cc. The reaction is adjusted to pH 7·2 with sodium hydroxide. To this mixture is added a mixture of 300 cc. of distilled water and 150 cc. of defibrinated rabbit's blood which has been allowed to stand till complete haemolysis has taken place. The resulting 1,000 cc. of medium is centrifuged till clear and sterilized by filtration through Seitz or Berkefeld filters. The medium should be used in a shallow layer at the bottom of a flask.

The metabolic studies were carried out with *L. donovani* grown in the liquid medium with or without sugar. In the absence of sugar there is a great increase in the ammonia nitrogen fraction and in the pH value in the medium. In the presence of dextrose there is a minimum of activity in the nitrogenous constituents of the medium, showing that for purposes of energy the organisms prefer carbohydrates to proteins. *C. M. W.*

HOFFMANN (J. M.) & SCHULTSZ (Th. W.). Züchtung eines frisch isolierten Kala-azar-Stammes auf NNN.—Agar und auf Blutplatten. [**Cultivation of a Freshly Isolated Leishmania Strain.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1931. Dec. Vol. 35. No. 12. pp. 700–705. With 5 text figs. [2 refs.]

Having obtained a freshly isolated culture of leishmania from a case of Indian kala azar, the author followed its behaviour in culture media, particularly on the surface of blood agar in Petri dishes. It was noted that the organism at first grew slowly and produced a large number of rosettes but later, after a number of subcultures, grew more rapidly and formed outgrowths from the inoculation streak, while few rosettes were formed. This alteration in the character of the growth accounts for differences between the descriptions of MAYER and RAY and CHRISTOPHERS, SHORTT and BARRAUD; the first two having investigated old cultures and the others freshly isolated ones. *C. M. W.*

TRENSZ (F.). La "séroflocculation palustre" de Henry dans la trypanosomiase caméline et la leishmaniose canine expérimentales. [**Henry's Malaria Test in Experimental Camel Trypanosomiasis and in Canine K.A.**]—*Bull. Soc. Path. Exot.* 1932. Mar. 9. Vol. 25. No. 3. pp. 230–234. With 1 text fig.

HENRY's claim that two types of antibody are produced as a result of two classes of antigen associated with infecting organisms has been tested by the author in experimental trypanosomiasis in guineapigs, and in experimental kala azar in a fox in N. Africa. HENRY states that the malarial parasite causes the production of antigens outside itself (exo-antigens) and at the same time produces others within itself (endo-antigens). To the latter class belongs the yellow pigment and the melanin. These substances give rise to antibodies in the serum, the presence of which can be demonstrated by flocculation tests. HENRY employed as substitutes for these pigments albuminate of iron and choroidal melanin and claimed that he never obtained a positive flocculation reaction in normal subjects, but did so in cases of malaria. The author has found that though the test is negative for normal guineapigs and dogs, the infected animals gave a positive reaction when the substances supposed to be specific for malaria were employed. It thus appears that HENRY's reaction can be given by the serum of animals infected with protozoa which do not produce either ferruginous pigment or melanin. *C. M. W.*

SALLE (A. J.). **The Electrical Behavior of** *Leishmania donovani.*—*Jl. Infect. Dis.* 1931. Nov. Vol. 49. No. 5. pp. 450–454. [29 refs.]

The author has found that in an electric field the cultural forms of *Leishmania donovani* migrate to the cathode at pH 2·16 and below, and to

the anode at pH 3·10 and above. The iso-electric point falling between pH 2·16 and 3·10 brings the parasite into line with the great majority of bacteria which have an iso-electric point at about pH 3. *C. M. W.*

VELU (H.), EYRAUD (E.) & PETITDIDIER. Recherches sur la leishmaniose canine dans la région de Casablanca, et sur la valeur de la formol-gélification comme méthode de diagnostic. [**Researches on Canine K.A. at Casablanca : the Formol-Gel Reaction.**]—*Bull. Soc. Path. Exot.* 1932. Mar. 9. Vol. 25. No. 3. pp. 227–230. [14 refs.]

The formol-gel reaction was performed with the serum of 280 dogs in the district of Casablanca. Forty gave a positive result in 15 minutes to 4 hours. The serum of these 40 dogs was further examined by the antimony test, while cultures and smears were made from the spleen and bone marrow with a view to demonstrating leishmania. The results were quite negative. The failure to discover leishmania and the fact that the serum of four dogs suffering from experimental trypanosomiasis gave a very rapid formol-gel reaction indicate that the test is of little value for the diagnosis of kala azar in dogs. In addition to the dogs mentioned above autopsies were performed on 30 other dogs without finding an infection. *C. M. W.*

TCHETAEW (N. A.). Réaction de Napier dans la leishmaniose canine. [**The Napier Reaction in Canine Leishmaniasis.**]—*Trop. Med. & Vet.* Moscow. 1931. Vol. 9. No. 3. pp. 128–132. [In Russian. French summary.]

The author applied Napier's formol-gel test to dermal and visceral canine leishmaniasis in Turkestan. There was no reaction or a slight opalescence of the serum in 45 dogs with dermal lesions, and none in control animals. In those with visceral leishmaniasis the solidified serum became opaque in varying degrees. The results were controlled by microscopical examination of the dogs, and the following conclusions were made :—(1) A sharp Napier's reaction indicates the presence of visceral leishmaniasis ; (2) a weak reaction indicates either a slight development or the initial stages of visceral leishmaniasis, or it may point to dermal leishmaniasis. One dog giving a positive reaction, failed to react in the following year though post mortem examination revealed a heavy infection with leishmania. A negative reaction is, therefore, an unreliable indication of the absence of visceral leishmaniasis. The test was applied to 517 wandering dogs rounded up for destruction in 1929. In ten that showed a positive reaction parasites were discovered microscopically. *C. A. Hoare.*

PARROT (L.), DONATIEN (A.) & LESTOQUARD (F.). Observations nouvelles sur le développement du parasite de la leishmaniose viscérale du chien chez un phlébotome (*Phlebotomus perniciosus*). [**Development of Parasite of Canine K.A. in Phlebotomus.**]—*Arch. Inst. Pasteur d'Algérie.* 1931. Sept. Vol. 9. No. 3. pp. 438–441.

The authors have already shown that the parasite of canine kala azar in Algeria develops in *Phlebotomus perniciosus* (see this *Bulletin,*

Vol. 28, p. 157). In the present paper further observations of the same kind are recorded. Sandflies were collected daily from the kennel of a dog suffering from kala azar and showing various ulcerations about the head and neck. The gorged sand-flies were kept for a few days in a humid atmosphere at laboratory temperature (24°C. to 27°C.) and then dissected. During June there were thus examined 58 sand-flies (10 on the second day ; 35 on the third ; 9 on the fourth and 4 on the fifth). Of these 14 (4, 6, 3, 1) were found infected with flagellates which showed a tendency to concentration at the anterior part of the stomach. The dog on which the sand-flies had fed was affected with ticks, particularly about the ears. Examination of 12 female ticks failed to reveal any flagellates or leishmania. *C. M. W.*

ADLER (S.) & THEODOR (O.). **Skin Infection in Canine Visceral Leishmaniasis.** [Memoranda.]—*Brit. Med. Jl.* 1931. Dec. 26. p. 1179.

Examining dogs suffering from kala azar in Malta, the authors have noted that wandering cells infected with leishmania are distributed almost uniformly throughout the intact dermis in all parts of the body, even in animals showing a very slight visceral infection. Sandflies (*Phlebotomus perniciosus*) fed on the intact skin of a dog with slight visceral infection became infected to the extent of 32 per cent. With two other naturally infected dogs, the figures were 62 and 65 per cent. None of these animals had cutaneous ulcers such as have been noted in canine kala azar by several observers. Spleen smears of the dogs showed leishmania, but in much smaller numbers than in spleen smears of average human cases of infantile kala azar, which give a relatively low infection rate with *P. perniciosus*. Blood smears of the dogs did not reveal any leishmania so that it appears probable that sandflies fed on dogs become infected by ingestion of parasites from the skin. In the sandflies the flagellates tend to assume an anterior position and behave as in sand-flies infected with leishmania of human origin.

C. M. W.

MILLS (E. A.) & MACHATTIE (C.) in collaboration with CHADWICK (C. R.). **The Rieckenberg Reaction as an Aid to Diagnosis in Chronic and Aberrant Types of Oriental Sore.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1931. Nov. 30. Vol. 25. No. 3. pp. 205–208.

The authors in Baghdad have tested the Rieckenberg reaction in human and canine cases of cutaneous leishmaniasis, and conclude that it is an aid to the diagnosis of chronic and aberrant types of oriental sore in an endemic area, when diagnosis by direct microscopical examination of old lesions is often a matter of considerable difficulty.

C. M. W.

BEHDJET (Houloussi). Die Behandlung und die seltenen Formen der Orientbeule. [**Rare Forms of Oriental Sore: Treatment.**]—*Dermat. Woch.* 1932. Jan. 23. Vol. 94. No. 4. pp. 138–142. With 6 text figs.

Writing from Constantinople the author describes various manifestations of oriental sore and records the fact that the disease can be

contracted there. He reviews a number of different treatments, and gives it as his opinion that diathermy yields the best results in the minimum of time. *C. M. W.*

DELAMARE (G.) & GATTI (C.). Fusospirochétose et leishmaniose cutanées. [**Fusospirochaetosis and Dermal Leishmaniasis.**]—*Bull. Soc. Path. Exot.* 1932. Feb. 10. Vol. 25. No. 2. pp. 141–145. With 7 figs. on 2 plates.

The paper describes two cases of muco-cutaneous leishmaniasis in both of which the right foot and the nasal mucosa were involved. In both cases large numbers of spirochaetes and fusiform bacilli were found in the ulcers, and it was noted that this secondary involvement did not give to the lesions the pseudo-membranous or gangrenous character nor the rounded form of a tropical ulcer. *C. M. W.*

SORINSON (N. S.). Beitrag zur Frage der Leishmaniasis cutanea. Versuch der Behandlung mit Goldpräparaten. [**Treatment of Dermal Leishmaniasis with Gold Preparations.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1932. Feb. Vol. 36. No. 2. pp. 53–71. [122 refs.]

The author has tested the therapeutic effect of intravenous injection of gold salts (krysolgan and sanocrysin) in cases of oriental sore. The number of injections given was six or seven and the total quantity of drug was 0·26 gm. of krysolgan in one case, 2·5 gm. and 2 gm. of sanocrysin in two cases, and 0·001 gm. of krysolgan with 0·65 of sanocrysin in a fourth case. In a fifth case treatment was in progress. As a complete cure was obtained in seven weeks or less, it is thought that the promising results demand further investigation of this treatment and its possible extension to kala azar. *C. M. W.*

SANTOS ZETINA (F.). Un caso de coexistencia de sífilis terciaria con leishmaniosis cutáneomucosa. [**Association of Tertiary Syphilis with Dermal Leishmaniasis.**]—*Rev. Méd. Yucatán.* 1931. Oct. Vol. 16. No. 9. pp. 166–170.

The case described is that of a man with ulceration involving the skin and mucosa of the mouth. A diagnosis of leishmaniasis and tertiary syphilis was made. The case failed to respond to arsenical treatment, but did so rapidly to injections of stybial (2 per cent. solution of sodium antimony tartrate). *C. M. W.*

CODAZZI AGUIRRE (J. A.). Denuncia de la presencia de leishmaniosis tegumentaria americana en el Norte santafecino. [**Dermal Leishmaniasis in Santa Fé.**]—*Semana Méd.* 1932. Jan. 21. Vol. 39. No. 3 (1984). pp. 245–247. With 1 text fig.

A record of two cases of cutaneous leishmaniasis in the North of the Province of Santa Fé in the Argentine. *C. M. W.*

MARMO (Achille). Contributo alla leishmaniosi esterna. [**Oriental Sore.**]—*Arch. Ital. Sci. Med. Colon.* 1932. Apr. 1. Vol. 13. No. 4. pp. 215–223. With 5 text figs. English summary (6 lines). [47 refs.]

An account of two cases of oriental sore from Asmara, Eritrea.

C. M. W.

DA CUNHA (Aristides Marques). Diagnostic de la leishmaniose tégumentaire par déviation du complément et intradermo-réaction.—*C. R. Soc. Biol.* 1931. Dec. 18. Vol. 108. No. 37. pp. 1076–1078.

A French version of the Portuguese paper reviewed in this *Bulletin*, Vol. 28, p. 646. *C. M. W.*

BROC, Revue critique sur le kala-azar.—*Tunisie Méd.* 1931. Sept.-Oct. Vol. 25. No. 8. pp. 417–425. [15 refs.]

JEAUME (G.). Un cas de leishmaniose naturelle généralisée chez le chien au Maroc.—*Bull. Soc. Path. Exot.* 1932. Mar. 9. Vol. 25. No. 3. pp. 225–227. With 1 text fig.

PINELLI (Anna). Il primo caso di leishmaniosi infantile a Catanzaro.—*Pediatria.* 1932. Feb. 1. Vol. 40. No. 3. pp. 147–150.

SCATURRO (Alberto). La leishmaniosi interna (kala-azar).—*Policlinico.* Sez. Prat. 1932. Feb. 29. Vol. 39. No. 9. pp. 331–334. [22 refs.]

MISCELLANEOUS.

FISCHER (Otto). Studien zur Pathologie und Epidemiologie Ost-Afrikas. Beobachtungen und Untersuchungen im Mandatsgebiet Tanganyika (Deutsch-Ost-Afrika). [**Pathological and Epidemiological Studies in Tanganyika Territory.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1932. Vol. 36. No. 1. pp. 1–104 (1–104). With 49 text figs.

The investigations here recorded were made in Tanganyika Mandated Territory, formerly German East Africa, in 1928–1930, and are set out in three chapters. The first contains notes on the geography and climate (4 pp.), the second deals briefly with the composition of the population, and birth and death rates (8 pp.), while the third, comprising the remainder of the paper, is devoted to the pathological conditions found, which are discussed under the headings A, Tropical and B, Non-tropical. In A, the following diseases are considered :—Malaria (9 pp.), sleeping sickness (7 pp.), leprosy (5 pp.), framboesia (including gangosa, goundou and juxta-articular nodules) (8 pp.), helminth infections (bilharziasis, intestinal helminthiasis and filariasis) (8 pp.); relapsing fever, leishmaniasis, smallpox and tropical ulcer each occupy one page, and three pages are devoted to rarer types of disease.

In B, there are two parts, viz.—I. *General infectious diseases*, under which heading children's diseases such as whooping-cough, measles, chicken-pox, mumps, scarlet fever and diphtheria are briefly discussed. Tuberculosis occupies 6 pages ; venereal disease, influenza, pneumonia, typhus, dysentery, rheumatic polyarthritis, anthrax, cerebro-spinal meningitis, poliomyelitis, tetanus and diseases of the eyes, each have a page or less allotted to them.

II. *Non-infectious diseases* are treated in four short sections as follows :—(*a*) Tumours, non-malignant and malignant (6 pp.) ; (*b*) mental diseases (7 pp.) ; (*c*) deformities (1 p.) and (*d*) other non-infectious diseases (2 pp.).

The author discusses the relationship between the Indian and Arab portions of the population and the Bantus, and endeavours to show an association of the mortality among children with such considerations as religion and marriage customs ; the adult native death rate, he considers, is small ; natives frequently live to a considerable age.

The most frequent disease of the East African is malaria ; on the shore of Lake Nyasa the author found, for example, 346 with parasites in 480 children up to 14 years of age. No case of congenital malaria was seen ; the blood of new-born children and their mothers was negative ; he expresses the view that, immunity having set in about puberty, the mother at her first birth is immune and, " she has no longer parasites in her blood which can pass to the child " ; he does not discuss placental blood findings.

He gives percentages for 1929 and 1930 to show that in two regions the incidence of simple tertian and malignant tertian was quite different in the two years at the same season. Crescent carriers in the low-lying country became fewer as the age increased to 14, whereas in the hilly country the number remained high to this age.

With regard to sleeping sickness, the author gives a map showing the distribution before the war, and the present day extent of the disease. It would appear from it that, at the former date, the disease

was on all the borders of the country, i.e., of Kenya, Uganda, Belgian-Congo, Northern Rhodesia, Portuguese East Africa, but only at one point inside Tanganyika Territory, at Liwale; now it is shown as widely extended.

Concerning yaws, the author states that in many districts no person escapes infection, and that the tertiary lesions of it are in no way distinguishable from those of tertiary syphilis. He lumbar-punctured framboesia cases in all stages, "especially those with tertiary signs"; no change in the spinal fluid or in the nervous system was observed in yaws cases. He mentions districts with yaws, others with syphilis predominating, and yet others with each in about equal proportions.

The author has given a certain number of percentages but the totals from which these are derived are not stated. The photographic illustrations are excellent but most of the subjects will be familiar to medical readers who know Central Africa. *B. Blacklock.*

i. LEDENTU. Essai de nosographie du Gabon. [**The Diseases of Gabun.**]—*Ann. de Méd. et de Pharm. Colon.* 1931. July-Aug.-Sept. Vol. 29. No. 3. pp. 427–451. With 1 map & 2 diagrams in text.

ii. ——. La médecine sociale et l'assistance médicale indigène au Gabon. [**Social Medicine and Native Medical Assistance in Gabun.**] —*Ibid.* pp. 452–479. With 6 diagrams in text.

i. The author comments on the paucity of his data, but puts his paper forward as a first survey.

In 1930 the consultations exceeded 100,000 [population of Gabun, 400,000], nine-tenths of which were "bush" consultations. These are the source of the figures. A table gives for 9 districts the percentages of the chief causes of morbidity according to hospital admissions and other attendances. Trypanosomiasis, for reasons stated, is excluded. Epidemic diseases make little show. Neither plague nor yellow fever occurs partly owing to the bad anchorage of the ports which prevents vessels from approaching very near the shore. Variola has not been seen for some years [but the presence of alastrim is mentioned.] Cerebrospinal meningitis has not been recorded since 1922. Of endemic diseases yaws figures with most frequency, representing 14 per cent. of the general morbidity, but the author justly points out that the success of modern treatment of yaws brings the natives in numbers and from great distances. Malaria represents 5·5 per cent. Amoebic dysentery, says the author, accounted for deadly epidemics in which 170 persons died out of 400. [The possibility of these having been bacillary dysentery is not discussed.] Beri beri formed 1 per cent. of the general morbidity. The frequency of leprosy is unknown and here the position is the reverse of that in yaws; treatment is such a long process that the native is little attracted. It is more common on the coast than in the interior. Filariasis ("*Filaria loa*") affects 80 to 85 per cent. of the population; it is a rare cause of morbidity. A form of epidemic diarrhoea, attributed by TRENSZ to a vibrio, is described at some length. Tuberculosis was diagnosed in 31 of 7,393 persons treated in hospital, i.e., 0·41 per cent. of admissions; its incidence in the interior is quite unknown. Venereal diseases, three-fourths syphilis, form 20·7 per cent. of the

general morbidity. In the extreme north syphilis is stated to furnish 64 per cent. of hospital admissions and attendances; BENEDETTI believes that 80 per cent. of the local population is infected. The author would combat it not by the creation of dispensaries but by multiplication of obstetrical consultations, a number of midwives each with a small area of action, and visiting nurses.

In the last two years 383,000 persons have been examined for trypanosomiasis and 4·5 per cent. found infected; its regional distribution is described. The disease is most prevalent on the eastern frontier where Gabun joins Moyen Congo.

Finally the author gives diagrams of the mortality from sporadic, endemic and surgical diseases over a series of ten years, as culled from hospital statistics.

ii. This paper deals with hospitals, vaccination, maternity and child welfare, depopulation and infant mortality, the causes of which are discussed, sanitary surveyance of labourers, prevention of trypanosomiasis, urban hygiene and plans for the further extension of medical services to the natives. One notes that there were at the end of 1930 15 doctors in the colony and a midwife; 86 native infirmiers and 4 infirmières. Statistics of the population for 1925 to 1929 show a diminution from 394,000 to 334,000, but the interpretation of these figures is difficult because the census taken in 1930 yielded 390,000. Other figures, however, are given to demonstrate the decline of population. *A. G. B.*

HARGRAVE (W. W.). **Health Conditions in American Samoa. Report of the Health Department for the Year ended June 30, 1930.**—*U.S. Nav. Med. Bull.* 1932. Jan. & Apr. Vol. 30. Nos. 1 & 2. pp. 104–133; 263–284.

Commander Hargrave, Senior Medical Officer at the U.S. Naval Station, gives a full account of the health conditions of these islands. The total deaths for 1930 in the population of 9,985 were 177; a crude death rate of 17·7 per mille. The infant mortality—41 deaths—was 104·07. The births numbered 394, a rate of 39·4 per mille; 220 were males and 174 females. It is noted that the system of collecting vital statistics is such as to make it unlikely that any births or deaths are unreported. Pneumonia was the chief cause of mortality, 160 cases with 40 deaths; bronchopneumonia was the predominating type. Tuberculosis, which caused 35 deaths, has been the leading cause of death for several years, but has diminished slightly in the last three. Filariasis was the primary cause of 19 deaths and influenza of nine. Five deaths were attributed to ascariasis.

The health of the Samoans was excellent throughout the year. The only epidemic was one of dengue in May-July. It is stated that practically every home in American Samoa is visited at least twice a week by some representative of the public health department so that all illnesses come to light. There were recorded 1,413 cases of Samoan conjunctivitis during the year, less than half those in 1929; it was almost uniformly present throughout the year and not chiefly in the breadfruit season.

It is "an acute inflammation of the eyes, which is more prevalent during the breadfruit season when flies are numerous. The conjunctiva and the

cornea are both frequently involved and serious consequences to the eye result either from neglect or from the native Samoan treatment.

"The Health Department Survey completed April 1, 1930, shows that there are 270 persons of all ages in American Samoa who are blind in one eye, or 2·92 per cent. of the total population and that there are 99 persons totally blind, or 1·07 per cent. of the total population. The percentage of blindness is high and is largely attributable to Samoan conjunctivitis and the Samoan or native practices that ensue."

No case of measles was reported this year; this disease occurs periodically in epidemic form with serious consequences; the last was in 1926. Bacillary dysentery was epidemic in Fiji in 1929–30 and in Western Samoa (British) early in 1931, so that quarantine was established against those islands. However, in March a case was discovered in American Samoa and others occurred in that and the succeeding months. There were three deaths, a fatality rate of 11 per cent. Whereas the Shiga bacillus was isolated in Fiji, in American Samoa cultures were negative except in two instances, in which the Flexner-Strong type was recovered. Typhoid is endemic but only five cases were reported. Of filariasis 641 cases were reported. It is stated that 665 persons in American Samoa are disabled from 5 to 6 days 3 or 4 months a year by some manifestation of filariasis; 239 have elephantiasis, 426 have fever or acute swelling or filarial abscess. Symptoms are rare before the age of 20, but practically 60 per cent. of the adults have microfilaria in their blood. "Filariasis probably causes greater damage than any other disease by reason of the disabling effect and the undermining of general health which in a way predisposes to other infections." Mosquito control is difficult because the vector, *Ae. variegatus*, bites by day and flourishes in the bush as well as in and around houses.

There were 679 admissions for yaws in this year, a drop from 1,040, which again was a drop from 1,404 in 1928. To avoid duplication of returns, cases are now reported by name, age, sex, and residence. A health survey showed that 5,719 persons out of 9,765 had, or gave a history of, yaws. 214 Kahn tests gave 91 per cent. positive reactions. The natives believe that yaws should not be treated till secondary lesions have developed and this is supported by SCHÖBL's work [this *Bulletin*, Vol. 25, p. 662]. Late or tertiary yaws is rarely seen in American Samoa which the author attributes to the fact that there are now few untreated cases. The Samoan has a decided antipathy to injections so that the author tried spirocide (acetarsone, stovarsol) given by mouth to 25 children with most satisfactory results. The cost of this treatment is five times as great as by neoarsphenamine injections but there are advantages in the enthusiasm for it of the parents and the willingness of the children to come for it. No case of syphilis was seen and only 8 cases of gonorrhoea. Roundworms, whipworms and hookworms are common but there is no marked debilitating effect from hookworm infestation.

The total cost of the health services was 92,711 dollars or 9·28 dollars per head per year, of which the U.S. Navy paid 8·14 dollars. All medical and surgical treatment is free to the Samoans, whether in their homes or in hospital. It appears that the collection of vital statistics is conducted with great efficiency and the author writes: "An experienced statistician is as essential to the organization as a qualified laboratory or X-ray technician." There is other matter of interest in this long report. *A. G. B.*

VENEZUELA GULF OIL COMPANY. **Hospital of Venezuela Gulf Oil Company. Fifth Annual Report. 1930.** [COOK (W. W.).]—77 pp. With 6 figs., 1 chart & 2 graphs. Maracaibo, Venezuela.

This Oil Company issues an Annual Report of its Hospital. The one under notice contains a number of papers on the diseases seen, laboratory statistics, and the usual tables. The Superintendent, Dr. W. W. COOK, notes that amoebiasis is a common infection at Maracaibo, and several cases of liver abscess are admitted each month; details of three cases are given; 7·5 per cent. of the total admissions are attributed to amoebiasis. Professor MÜHLENS of Hamburg writes on the diseases of Venezuela. At present, he says, there is not a sure focus of yellow fever in the country but its carrier [attractively named by the printer Stegomyia fascinator] is abundant. Plague also is not now reported. Figures are given of the malarial index; blackwater fever is said to be rare. Relapsing fever and Chagas' disease are frequent in certain parts. Dermal leishmaniasis, especially that with deep destruction of bone of mouth and nose, called espundia, is not rare. Rectal schistosomiasis is endemic in some parts and *F. bancrofti* infestation, but elephantiasis was not seen. Tumour-like diseases of the dorsa of the feet and toes were noted by MÜHLENS; they suggested mycetoma and mossy foot. The feet and legs were swollen as in elephantiasis. The spirochaetes described by STRONG in the similar disease in Amazonas were not found [see this *Bulletin*, Vol. 24, p. 324]. Ill-defined fevers, often treated as malaria, are probably typhoid and paratyphoid, especially para A. Drs. LEONARDI and WALKER describe two cases of relapsing fever, the spirochaetes seen in which were assumed to be *Sp. venezuelensis* and the vector *Ornithodorus venezuelensis*.

The laboratory statistics furnished by Dr. A. J. WALKER show 384 positives for tuberculosis (sputum) or 18·7 per cent. of examinations in a five-year period. In the last two years the Kahn reaction was tested twice yearly on all native employees—6,671 and 5,083 examinations. The positives in these years were 22·6 and 22·0; reactions in malaria and weak reactions in patients under treatment are omitted. The results of stool examinations are tabulated; the percentage of *E. histolytica* findings, 4 per cent., is not excessive. *A. G. B.*

WAR OFFICE. **Report on the Health of the Army for the Year 1930. Volume LXVI** [FAWCUS (H. B.), Director-General, Army Medical Services].—pp. iv + 151. With 4 charts. 1932. London: H.M.S.O. [2s. 6d.]

This report contains much that is of interest to *Bulletin* readers. In the Notes on Diseases the following extract illustrates the difficulties of antimalarial work :—

"Little anti-malarial work by the military authorities is possible in this area [Shanghai]. The troops live in hutted camps on a minimum of ground space surrounded by Chinese-owned land and sluggish streams, ditches and swamps, all swarming with mosquitoes. The municipal authorities, whose actions are restricted by fear of political complications, have made certain essays at anti-malarial work by oiling, the use of Paris green and by the introduction of predatory fish, but the oiling was objected to on account of the smell, the Paris green on account of its lethal action on the local ducks, while the predatory fish, though in no way objected to, only acted as an 'extra' to the dietary of both Chinese and ducks."

Apropos of the fact that sand-fly fever caused 3,199 admissions of soldiers to hospitals (and was 5th on the list), whereas dengue was diagnosed in only 822 cases :—

"It is surprising that an infection so widespread in its range should be responsible for less sickness than sand-fly fever. There is reason to believe that some considerable proportion of the cases diagnosed as sand-fly fever in India are in reality dengue, an opinion supported by the high re-infection rate which is recorded for sand-fly fever in some Indian stations. In experimental work with dengue fever, some of the successful infections are so mild that the subjects show none of the classical signs, and little or no constitutional reaction, and yet are infective to mosquitoes. The grouping of such mild attacks occurring naturally, varies according to the views of the observer, and in some stations they will be called dengue, in others, sand-fly fever, influenza or P.U.O."

Two cases are described of epilepsy due to cysticercosis and it is stated that several others have been met with in men who have served in the tropics.

Health of the Army Abroad—India—

The principal causes of admission to hospital of 33,882 soldiers (611 per 1,000 of the strength) were :—

Malaria	6,564
Sand-fly fever	2,739
Inflammation of areolar tissue	2,219
Inflammation of tonsils	1,667
Gonorrhoea	1,519
Dysentery	1,264
Diarrhoea	979
Dengue	523
Boils	410

28 dysentery carriers were admitted.

Under *Enteric Fevers* it is noted that there were 69 fewer admissions for typhoid than in 1929. At the end of 1929 and during 1930 the great majority of the troops were reinoculated with two doses of ½ and 1 cc. T.A.B. vaccine instead of, as in former years, one dose of 1 cc. The sudden decrease may be related to this. The diagnosis in 90 per cent. of British and 86 per cent. of Indian cases was made by blood culture ; the average day of successful culture was the 7th. Cultures must be incubated for several days before a negative report is made.

The table gives the incidence of enteric among protected and unprotected troops :—

Group.	Strength.	Actuals.		Ratio per 1,000		Case mortality per cent.
		Cases.	Deaths.	Cases.	Deaths.	
Protected ...	54,236	182	11	3·36	·23	6·0
Unprotected ...	1,191	25	2	20·99	1·68	8·0

Of the 1,264 cases of *dysentery* among British troops the following types were found :—

Protozoal (*E. histolytica*)	185	
Bacteriologically proven bacillary dysentery	431	820
Bacillary exudate (no dysentery bacilli isolated) ...	389	
Clinical	259	

It is considered that the exudate described as bacillary is pathognomonic of bacillary dysentery. Thus 64·8 per cent. were bacillary, 14·6 per cent. protozoal and in 20·4 per cent. the cause was not discovered. Most of these are considered to be mild Flexner infections and a small proportion mild *histolytica* infections. Bact. Flexner is the main source of dysentery in India ; it is usually very mild but may be very severe, while Bact. Shiga infections, usually severe, may be mild. A table is given of the results of examinations of Indian menials for *E. histolytica* cysts. The proportion is about 10 per cent. Since only three examinations are carried out prior to enrolment of cooks, etc., many carriers must be missed, but " it seems that such carriers do little harm." There has been a drop in the incidence of amoebic dysentery, amoebic hepatitis and liver abscess since 1924, due to improved diagnosis and treatment.

Malaria. The trials of plasmoquine and quinine in 1929 in treatment were noticed in this *Bulletin* (Vol. 28, p. 1007, MANIFOLD). It was highly satisfactory in controlling pyrexia and preventing relapses. The dose of plasmoquine was 0·04 gm.

" Work during 1930 carried out at the anti-malarial centre was largely directed to ascertaining whether by reducing the dose of plasmoquine to 0·03 grm. per diem equally good results could be obtained in the treatment of the disease and the prevention of relapses. The results up to date indicate that the percentage of relapses is approximately the same as with the larger dose and that symptoms of toxaemia are negligible. One hundred and thirty-three men at the malaria treatment centre were given a full course of this treatment as out-patients. These men all carried out their ordinary duties and recreations throughout the course.

" This treatment has also been carried out during the year under the supervision of the specialist in medicine, Southern Command. Two hundred and thirty-three cases were treated with only 5 relapses. The patients in this series were kept in hospital for 8 days from the onset of the attack of pyrexia, and were then discharged from hospital to attend daily for the remaining 13 days of the course. During the latter period they were excused all duties."

The urine of a number of chronic malaria cases was found to contain albumin—16 out of 58 in hospital. " It was considered that the quinine was the main agent in the production of the albuminuria." Under Anti-Malarial Measures we read :—

" An ' oil bomb ' consisting of empty cigarette tins perforated with holes and filled with oily rags was devised at the M.T. depot at Chaklala. These tins were thrown into the ponds, etc., and were found to oil the water satisfactorily. A novel method of oiling ponds where opposition had been encountered was devised by one warrant officer in charge of anti-malarial work. His method was that of oiling the local buffaloes during the night, so that during the day they acted in a similar manner to the oil bombs described above, although on a larger scale."

Spraying experiments for barrack rooms are described ; they seem to have been less successful than those recently described in this *Bulletin* (HOLT, *ante*, p. 318). *A. G. B.*

KLEINE (F. K.). Der Anteil R. Kochs an der Erforschung tropischer Seuchen. [**R. Koch's Part in the Investigation of Tropical Diseases.**] —*Deut. Med. Woch.* 1932. Mar. 25. Vol. 58. No. 13. pp. 505–508.

In the celebration of the jubilee of the discovery of the tubercle bacillus, of which the German journals are naturally full, Kleine who

worked with KOCH for many years contributes an account of his discoveries in the tropics.

In KOCH'S cholera expedition to Egypt (1883) he found parasites which were not bacteria in the gut mucosa of a man dead of acute *dysentery*, and again in the liver capillaries in a case of liver abscess. His pupil, KARTULIS, studied these bodies—amoebae—and showed their relation to dysentery.

While in Dar-es-Salaam in 1897 he heard that there was a disease with *plague*-like symptoms at Kisiba on the Victoria Nyanza. KOCH sent ZUPITZA to the spot, near the Uganda border. In the preparations made by him KOCH recognized the plague bacillus. Thus another endemic focus was revealed.

R. PFEIFFER, writing in 1892, stated that in reference to the possible development of the *malaria* parasite outside the body KOCH had suggested its conveyance to man by a blood-sucking insect. ROSS'S work followed in 1897. In investigations in New Guinea and Java KOCH showed the great difference in the percentage of those infected at different ages. Children under 2 years had 100 per cent. of parasites, those between 2 and 5 years 46·1 per cent., those between 5 and 10 23·5 per cent., and adults none. He concluded that with continual subjection to infection an immunity develops. He tried to infect anthropoids but without success. He concluded that man and anopheles are the only hosts, and seeing the difficulty and expense of eradicating the mosquitoes he recommended careful treatment of those recognized by microscope to be infected, and the prevention of new infections by quinine prophylaxis. An experiment to the first end in Dar-es-Salaam was unsuccessful owing to changes in the population and the insufficient parasiticidal action of quinine. In 1900 on KOCH'S instigation Europeans in East Africa and New Guinea began quinine prophylaxis, and from that date the deaths from malaria and blackwater diminished.

His work on *relapsing fever* in East Africa was synchronous with that of DUTTON and TODD. He watched the development of spirochaetes in ticks which had fed on infected monkeys, and questioned the existence of a stage in which these parasites were invisible. In 1897 he made an experiment of immunizing cattle against *tsetse disease*. He passed the trypanosomes through rats and dogs and then back to healthy cattle, and found that parasites so treated were weakened in virulence. From the susceptibility of so many species of animal, the variability of virulence and the varying morphology in different animal species KOCH (1904) concluded that the trypanosomes of the *brucei* group were not yet fully adapted to their hosts and were not fixed species ; they were in a stage of mutability. At a time when BRUCE believed that the tsetse transmitted the trypanosomes mechanically like a soiled needle, KOCH thought that in view of the scantiness of parasites in the blood in many instances there must be a development in the insect and he was confirmed in this opinion by the twice repeated discovery by one of his colleagues of trypanosomes in the salivary glands of tsetse. His arguments influenced Kleine who in 1909 proved that this view was correct. In 1906 KOCH was sent to East Africa in charge of a Sleeping Sickness Commission and here Kleine attributes to him two advances—the study of thick blood films stained, without previous treatment, with eosin and azur II for discovery of trypanosomes, and the introduction of systematic treatment by atoxyl to

eradicate the disease ; he sought to get rid of the source of infection by keeping the blood of the infected free from parasites.

Nothing is said here of KOCH's contributions to the investigation of diseases of domestic animals in Africa—rinderpest, East Coast fever, African horse sickness—which Kleine describes. It will be admitted that KOCH's part in the investigation and combating of diseases in the tropics was extraordinarily great. Had he been able to spend longer periods away from Berlin, it might have been even greater. *A. G. B.*

RUGE (Reinhold). Welche von den sowohl im tropisch-subtropischen Gebiet als auch in der eigentlich (mittleren) gemässigten Zone vorkommenden Krankheiten sind als Tropenkrankheiten zu bezeichnen ? [**What are Tropical Diseases ?**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1932. Jan. Vol. 36. No. 1. pp. 19–22.

A further paper on this subject [*ante*, p. 231] which has come into importance since " tropical diseases " now count under the German Sickness Insurance Law. The author briefly discusses the diseases whose position might be regarded as doubtful. He would include under tropical diseases, malaria, ankylostosomiasis, cholera, dengue and pappataci fever, kala azar, leprosy, undulant fever, plague and tick-transmitted relapsing fever. He would exclude, as cosmopolitan, bacillary dysentery, typhus, smallpox and louse-transmitted relapsing fever. *A. G. B.*

MASCALL (A. J.). **Notes on Certain Tropical Diseases.**—*Trans. Faculty of Actuaries.* 1931. Vol. 13. Pt. 8. No. 122. pp. 289–312.

Mr. Mascall, Assistant Secretary, Standard Life Assurance Company, discusses in an interesting manner malaria, blackwater fever, yellow fever, filariasis, cholera, dysentery, sprue, sleeping sickness, leprosy, as diseases to which the higher mortality of assured lives in hot countries can be attributed, besides hookworm disease, yaws, beri beri and pellagra which have little influence on assured lives. A long discussion followed. *A. G. B.*

BALFOUR (Margaret I.). **Résumé of Report on the Role of Medical Women in Exotic Countries.**—*Jl. Assoc. Med. Women in India.* 1931. Nov. Vol. 19. No. 4. pp. 5–6, 8–10, 12, 14–25.

The term, exotic countries, means here countries outside Europe, but the report deals in fact with the less developed countries. The information was obtained by a questionary to which replies were received from 43 medical women in 18 different countries. The subject matter is considered under the heads :—

" I.—The special needs which require the presence of medical women in exotic countries and the extent to which these needs are being met.

" II.—Suggestions for forwarding the work of medical women in exotic countries in order to meet the needs more fully."

I. is subdivided into—habits and custom of the people, conditions of child birth, infant mortality, venereal disease, miscellaneous.

This report, itself a résumé, cannot be summarized but is worth reading. *A. G. B.*

i. LULL (George F.) & LOPEZ RIZAL (L.). **Causes of Death among White Residents of Manila.**—*Milit. Surgeon.* 1931. Dec. Vol. 69. No. 6. pp. 619–624.

ii. PEAK (I. F.). **Philippinitis.**—*Ibid.* pp. 595–607. [10 refs.]

i. Here are studied the mortality statistics of white residents of the City of Manila for the ten years 1921 to 1930 : members of the army and navy are excluded. There were 418 deaths, 353 of males, 65 of females. A table shows their distribution by quinquennial age groups. Excepting a group of 13 under 5 years almost all were twenty years and upwards. The mortality rates of Americans in Manila are considerably lower than for the U. S. registration area but the age distribution is very different. The most important causes of death among 143 [? 147] residents of ten years and more were as follows :—

Cardiac disease	24	Syphilis (all types)	5
Nephritis and Cardio-renal ...	18	Cerebral Haemorrhage ...	5
Malignant disease	13	Appendicitis	4
Tuberculosis (all forms) ...	10	Pernicious Anaemia	3
Pneumonia	8	Malaria	3
Dysentery (all types) ...	8	Death by violence	3
Cirrhosis of liver	7	Diabetes	2
Alcoholism (including alcoholic psychosis)	6	Bronchial Asthma	2
		All others	26
Total		...	147

This is compared with the State of Michigan in which the most important causes of death were, in the order mentioned :—

Organic heart disease	Cerebral haemorrhage
Diseases of the respiratory system (exclusive of T.B.)	Accidents
Cancer	Tuberculosis
	Nephritis

Taking all the deaths in Manila in the ten-year period cirrhosis of the liver accounted for 3·8 per cent. and alcoholism for 3 per cent. In Filipinos liver cirrhosis is a rare cause of death, one or two a year among the 300,000 population of Manila City. Suicide also ranks high among Americans. Tropical diseases, dysentery and malaria excepted, do not appear in the list.

ii. A discursive discussion of the effects of tropical service on the mind. The author states that he was little more than a year in the country. *A. G. B.*

LULL (George F.). **Since the Days of the Empire.**—*Milit. Surgeon.* 1931. Nov. Vol. 69. No. 5. pp. 512–517.

This article, by the Medical Adviser to the Governor General, Philippine Islands, gives a table of annual death rates per 100,000 Philippine population for tuberculosis, malaria, beriberi, dysentery, cholera and smallpox from 1904 to 1929 and briefly discusses the epidemiology of each. The only one of these diseases which is clearly increasing is beriberi and measures to combat it are made difficult by the fact that Filipinos like a highly polished rice ; it tastes better and keeps better than one undermilled or unpolished. It appears that augmentation of the diet is likely to be more effective than an attempt

to substitute unpolished rice. Intestinal parasitic infestation and nutrition and diet are also briefly discussed in relation to the diseases in question. *A. G. B.*

RONNEFELDT (F.). Behandlung von Verdauungskrankheiten bei westafrikanischen Eingeborenen. [**Treatment of Digestive Disturbances in West African Natives.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1931. Dec. Vol. 35. No. 12. pp. 696–700.

Besides the parasitic diseases of the digestive tract functional disturbances are common in natives, either as a result of the presence of the parasites, or independently. These disturbances require symptomatic treatment. Not much can be expected from changes in diet. The common hypochlorhydria is easily improved by administration of HCl, which is often beneficial also in constipation. Flatulence must be treated with the usual remedies. Drastic purges, which are used by the natives themselves, are very important. Such symptomatic treatment can be carried out at small expense. The author refers to the inordinate, to the European, use of red pepper; this, he thinks, has to do with HCl production in the stomach, and if the European is to acclimatize himself he should take to this practice. For flatulence he mentions asafoetida to which the native takes readily. *A. G. B.*

FRONVILLE. Les affections du foie chez les indigenes. [**Liver Affections in Natives.**]—*Ann. Soc. Belge de Méd. Trop.* 1931. Dec. 31. Vol. 11. No. 4. pp. 443–453.

A lecture given before the Cercle Médical du Katanga. The author reports the surgical affections of the liver seen by him at the native hospital between 1918 and 1929.

Liver abscess: 8 cases. Not common because most of the dysentery is bacillary.

Tuberculosis: 2 cases, found at autopsy.

Adenoma: 1 case, found at autopsy.

Hydatid cyst: 1 case, again an autopsy finding.

Primary cancer: 8 cases, out of 25,000 hospital admissions.

Some interesting information is given about hydatid at Elizabethville. A table shows that in 11 months of 1924 and 1925, 563 hydatid cysts were detected at the abattoir, 530 in cattle (from Rhodesia), 29 in sheep and 2 each in goat and pig. The lung was by far the commonest site, about 10 times as frequent as the liver. The infected beasts represent about 10 per cent. of the slaughterings. Nothing is known of canine infestation. The author explains the rarity of hydatid in man by the facts that the pastures are far from centres of population, and there are no shepherds' dogs and no native cattle, only goats which are little affected. He suggests precautions against infection of dogs. *A. G. B.*

HICKS (C. Stanton), MATTERS (R. Francis) & MITCHELL (Mark L.). **The Standard Metabolism of Australian Aboriginals.**—*Australian Jl. Experim. Biol. & Med. Sci.* 1931. Mar. 16. Vol. 8. Pt. 1. pp. 69–82.

This is an interim report of work undertaken for the Carnegie Institute of Boston, as part of a general metabolic survey of aboriginal races

throughout the world. The Benedict portable apparatus was used and proved to be an excellent field apparatus. The chief difficulty lay in occluding the nostrils which in the aboriginals are large, widely spaced and often strengthened by extraordinarily firm cartilages. The subjects, forty in number, were all pure-blooded aboriginals of the Kokata tribe. Oxygen consumption was found to deviate by at least 11 per cent. for females and 13 per cent. for males using European standards of measurement. Standing and sitting height measurements showed that 52 per cent. of the subjects gave a von Pirquet index of over 100. In view of these abnormal pelidisi measurements it is considered doubtful whether European standards for computing basal metabolism are applicable in these cases. *M. E. Delafield.*

KRISHNAN (B. T.) assisted by C. VAREED. **Basal Metabolism of Young College Students, Men and Women, in Madras.**—*Indian Jl. Med. Res.* 1932. Jan. Vol. 19. No. 3. pp. 831–858. With 4 charts. [14 refs.]

Basal metabolism determinations were made on 76 men and women of Southern India of ages ranging from 18 to 25. All the subjects were medical students who had some knowledge of metabolism and of the methods used in its study. The apparatus used was the Benedict-Roth with Collin's Kymograph attachment and body surface was computed from the Aub-Du Bois height-weight formula. Three determinations were made for each subject, and only the minimal basal rates were taken into consideration and compared with the standards of Du Bois, Harris-Benedict, Dreyer and Krogh. Taking the subjects as a whole the basal rate is considerably lower than the rates determined in other countries. The factors which account for the lowering of basal metabolism in South India by 12 per cent. in men and 16 per cent. in women as compared with the Du Bois standard are discussed. It is considered that the lowering of metabolism is due not to a racial difference but to the ready muscular relaxation in the tropical climate of Madras and to the low protein diet in South India. The influence of the menstrual cycle was also studied. A rise in basal metabolism is noted in the pre-menstrual period and in the second week after menstruation.

M. E. Delafield.

SHILLONG. **King Edward VII Memorial Pasteur Institute and Medical Research Institute. The Fourteenth Annual Report for the Year ending 31st December 1930** [MORISON (J.), Director].—18 pp. With 1 folding chart. 1931. Shillong. [10d. ; 9 annas.]

The most interesting matter in this report is that relating to the combined cholera-dysentery bacteriophage prepared in the Institute, of which 112,213 doses were issued during the year. Cholera in Assam shows its heaviest incidence on the population of villages situated "along the banks of certain rivers which are spillways or old river beds." Two of the areas which come under this description, in Nowgong and South Sylhet respectively, have been selected for a test having something of the character of a statistically arranged trial. In South Sylhet ordinary methods, by which are meant vaccination, cholera mixture treatment and hygienic measures, were employed: in Nowgong bacteriophage was distributed to headmen of villages for use in every

case of diarrhoea or suspected cholera. The latter area "has passed through successive epidemic seasons and at the time of writing has not had a single death from cholera for ten months. This has not happened during the previous ten years." The former area has had a cholera visitation each season as usual. It may not be possible to continue this trial on the lines of a control area side by side with a test area but proof of the degree of efficacy of bacteriophage may still be forthcoming by its continued use in a single district which has ordinarily a periodic cholera incidence. It is evident that work of considerable importance is also being done in the Institute with respect to the separation and maintenance of what should now be recognized as definite types of cholera and dysentery bacteriophages. *W. F. Harvey.*

FEDERATED MALAY STATES. **Annual Report of the Institute for Medical Research for the Year 1930** [KINGSBURY (A. Neave)].—*Federated Malay States Ann. Rep. Med. Dept. for Year 1930.* Appendix I. pp. 95–185.

This is a model report, both in outward features and in inward conciseness and precision; about half of it—what may be called the better half—describes or reviews research; the ancillary half is a record of routine.

Under the general heading of Research the following particular investigations have to be briefly noticed. (1) A conspectus of the careful and comprehensive studies of Tropical Typhus that have been proceeding for some time and have already received considerable notice in this *Bulletin.* It is highly probable that the disease is a natural infection among rats in Malaya; it is practically certain that the causal agent is a small pleomorphic Gram-negative micro-organism, both intra- and extracellular, sometimes showing as minute coccal and diplococcal (virulent) forms resembling Rickettsia, sometimes as fusiform and diphtheroid bacilli (less virulent) and bipolar-staining cocco-bacilli; and it is more than probable that the usual transmitter to man is a Trombicula mite. Dr. L. ANIGSTEIN's prophylactic vaccine prepared from formolized cultures of the micro-organisms is considered specially worthy of mention.

(2) The Malaria studies include a field experiment on the prophylactic value of plasmoquine; experimental inquiries on the effect of plasmoquine on gametocytes of *P. falciparum*; experimental treatment of malaria with quinine-stovarsol; and an account of a malaria parasite of monkeys (*Macacus cynomolgus*) carried (experimentally) by the local Anophelines. (*a*) In the field experiment on plasmoquine-prophylaxis a malarious rubber-estate was chosen for experiment and two neighbouring similar but less malarious estates were observed systematically as "controls." On the experimental estate everyone received plasmoquine twice a week (adults in 0·04 gm. dosage and children and young infants in dosage suitable). Unfortunately, from economic causes the population of this estate steadily declined; but the following figures are significant. Without any diminution of Anopheles breeding, in 9 months, among the original population of the experimental estate who remained, the *P. falciparum* gametocyte-rate fell from 10·6 to 0·0 per cent., and the malaria parasite-rate from 27·2 to 17·4 per cent. (The malaria parasite-rate on one "control" estate was 22·9 per cent. at the beginning and 23·8 per cent. at the end of the nine months; and in the other "control" estate it

fell from 17·2 to 13·7 per cent. in that term. (*b*) Experiments are described showing that fresh Anopheles fed on crescent-carriers before and after these had received plasmoquine did not become infective when the crescent-carriers had received 0·4 gm. of the drug and then remained non-infective for at least 3 days; that plasmoquine failed to stop nearly-mature crescents getting into the peripheral blood, but that it destroyed them in their early stages of development. (*c*) Experiments are described in critical detail showing the effects of quinine-stovarsol in treatment and on malaria-parasites and crescents, and also on the effect of quinine on the production of crescents; quinine was found to be little destructive on crescents and quinine-stovarsol to be no more potent than quinine. (*d*) An admirable study of a malaria parasite discovered in *Macacus cynomolgus* is described. In structure the parasite closely resembles *P. vivax*; infected red cells show enlargement, pallor, and stippling; it produces 8 to 14 schizonts; in some respects it also resembles *P. kochi* of Cercopithecus and *P. inui* of a Borneo monkey. It is easily inoculated into fellow monkeys. Three species of laboratory-bred Anopholes (*maculatus*, *kochi*, and *vagus*) took infection from monkeys, but *Culex fatigans*, *Stegomyia albopicta* and *Armigeres obturbans* "have been consistently negative" to infection. The oocysts (*A. vagus*) and sporozoites (*A. maculatus* and *kochi*) are impossible to discriminate from those of human malaria.

(3) Mosquito investigations confirm, by experiment with iron pyrites, the current statement that waters charged with iron are comparatively free from larvae of Anopheles; other experiments on colour-tropism of Anopheles are recorded. (4) Two cases of Japanese River Fever in young European planters are abstracted; in both there was a suspicious superficial lesion, and an eruption. (5) In Beriberi, for the liquid extract of rice-polishings the solid extract obtained by adsorption on acid clay has been substituted in tablet form; it appears to be beneficial, particularly in early stages of the disease, and may be of still greater value as prophylactic. (6) The results of an investigation of the diagnostic value of the Widal reaction with H and O agglutinins are recorded at some length. (7) Other experimental studies briefly noticed are a complement-fixation test cases of leprosy with an emulsion of *B. tuberculosis* as antigen; treatment of yaws by halarsol; treatment of "burning feet"; Schick-testing for diphtheria, the incidence of which malady seems on the increase, and Dick-testing for scarlet fever; potency tests for vaccine lymph; and bacteriological analysis of various water-supplies in the Federation. The typing of local pneumococci has been continued, and an account is given of the progress of canine anti-rabies vaccination. Formerly dogs bitten by or coming in touch with a rabid animal were destroyed, and all other dogs within a radius of about half-a-mile were given a single inoculation of 6 cc. of vaccine; this was good enough in outbreaks but did not much diminish the incidence of the disease. At present vaccination is a condition for a dog-licence, and the licensed dog has to bear a metal disc; in the year 3,200 dogs were inoculated in Kuala Lumpur.

From the recorded Routine of the Institute in its numerous subdivisions certain facts and events of more than local interest may be selected. (1) In prophylaxis against rabies in the human victim Semple's method is followed. Unused vaccine is discarded after the lapse of six months. During the year the number of cases (all races) treated was 160, with no death, but four fatal cases were reported, not one of which had received antirabic treatment; the brain was

examined in 106 animals, and Negri bodies were found in 38 dogs and 1 calf. To the Veterinary Department 3,365 doses of canine vaccine were issued. (2) In the division of pathology 117 cases of malignant tumours (carcinoma and sarcoma in their several types and varieties) were identified ; 10 in Europeans, 3 in Eurasians, 8 in Malays, 68 in Chinamen, 1 in Japanese, and 27 in Indians (Tamils). (3) A widespread outbreak of smallpox necessitated enormous activity in the vaccine lymph department, an amount of lymph equal to the normal produce of two years being issued in three months of autumn. No reports of excessive reaction to vaccination, or of sequelae affecting the central nervous system have been received in this department.

A. A.

i. ARCHIVES DES INSTITUTS PASTEUR D'INDOCHINE. 1930. Apr. No. 11. pp. 45–65.—Services pratiques des Instituts Pasteur d'Indochine. [**Work of the Pasteur Institutes of Indochina.**]

ii. ARCHIVES DES INSTITUTS PASTEUR D'INDOCHINE. 1931. Apr. No. 13. pp. 81–100.—Fonctionnement des Services Pratiques des Instituts Pasteur en 1930.

i. There are three Pasteur Institutes in Indochina : Saigon, Nhatrang and Hanoi.

Saigon. A table shows for what purpose the 30,000 examinations were made and the results ; examinations for malaria are listed separately. Nearly 14,000 were syphilitic tests, and nearly 10,000 were tests for dysentery. 1,804 persons presented themselves for antirabic treatment and 1,364 lasted the course ; 7 of these died. The number of applicants rises yearly. The laboratory distributed 5,294,130 doses of antivariola vaccine, for which 279 buffaloes were employed and 6,808,318 doses of anticholera vaccine, besides 342,949 doses of divers other vaccines. In the year 1927, to permit of wholesale vaccination against cholera in Cochin-China, over 24 million doses were furnished. Of serums for treatment of various diseases 94,705 flasks were delivered. In the tuberculosis laboratory in the 4 years, 1926-1929, 260,000 doses of BCG were produced, sufficient to vaccinate 86,000 babies. A malaria laboratory is active ; 5,981 blood examinations were made. The laboratory for the suppression of adulteration has examined wines, mineral waters, lemonade, syrups, conserves, milk ; 2,787 estimations were required ; 43 per cent. of the samples were not up to standard.

Hanoi. A similar table of microbiological examinations, including malaria, is given. 853 people came for antirabic treatment. Of antivariola vaccine 5,385,240 doses were supplied. Other vaccines mentioned came from Saigon. 24,533 Tonkinese babies have been immunized since 1926 by BCG. 615 liters of cultures of the Bulgarian lactic bacillus were supplied to practitioners.

Nhatrang. This institute is veterinary.

Under the heading Stations of Vegetal Biology details are given of the cinchona plantations. For the study of malaria the chief of the malaria laboratory together with an engineer spent a month in British Malaya and in Sumatra. They came to the conclusion that epidemiologically Cochin-China is more closely related to Sumatra for the lowlands and gray soils and to British Malaya for the red soils which for the most part constitute upper Cochin-China. The problem is, however, complicated by the presence of an anopheline carrier which is

practically absent in Malaya and Sumatra but is active in the Philippines. They pay a warm tribute to the work accomplished in British Malaya (monument grandiose à la gloire de la science coloniale britannique).

ii. The report for the following year is on similar lines and shows a general development of these services. *A. G. B.*

GENEESKUNDIG TIJDSCHRIFT VOOR NEDERLANDSCH-INDIË. 1932. Jan. 1. Vol. 72. No. 1. pp. 3–18.—Jaarverslag van de Landskoepokinrichting en het Instituut Pasteur te Bandoeng over 1930. [**Annual Report of the Vaccine Establishment and the Pasteur Institute at Bandoeng in 1930.**]

From this report the following items may be cited :—

The total quantity of smallpox vaccine delivered by the institute sufficed for over 8·5 million vaccinations. As far as accessible for control the vaccinations were successful in 97·7 per cent. Experiments with desiccated vaccine, said to give very favourable results, are continuing.

Antirabic treatment was judged necessary for 874 patients out of 1,059 reporting for this purpose. 686 (117 Europeans and 569 natives) underwent a full course of treatment, either because they were bitten by actually rabid animals or because such could not be safely excluded. Out of the latter group in 6 cases (natives) rabies broke out notwithstanding the cure, in 4 cases within the limit of 30 days from the bite, in 2 cases 33 and 32 days after the infection. The cure itself gave no untoward by-effects.

The laboratory researches concerning the bacteriological types of pneumococcus on Java and on the diphtheria carrier rate among the native population have already been referred to.

The quantities of prophylactic and therapeutic sera and vaccines issued by the institute are mentioned.

Serious reactions following the administration of a mixed cholera-typhoid-dysentery vaccine induced a special study of this subject, which showed (1) that the rate of absorption of the vaccine which is retarded by the higher concentration of the mixed vaccine enables the dysentery bacillus to develop its local toxic action, (2) that women and children were much more susceptible to serious reactions than men, (3) that increasing the formol content of the vaccine from 0·5 to 0·8 per cent. did not render it atoxic, but greatly diminished its toxic effect. *W. J. Bais.*

KOUWENAAR (W.). Het Pathologisch Laboratorium te Medan. 1906–3 October–1931. [**Pathological Laboratory Medan, 1906–31.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1931. Nov. 1. Vol. 71. No. 15. pp. 1218–1227. With 3 plates.

The silver jubilee of the laboratory induces its present director to give a brief review of its history. The centralization of the hospital service on the East Coast of Sumatra in the beginning of this century, and the growing interest in questions of tropical pathology and hygiene urged many of the medical men to ask the advice of one of the few doctors who could at that time dispose of a well equipped clinical laboratory. A central laboratory to deal with these questions was therefore founded in 1906 by the three most important tobacco companies. Since 1918 the Government has given financial support, and in 1920 the institution was taken over by a

managing committee under the care of the two planters' associations. A short summary is given of the practical and scientific work performed by the laboratory workers in the course of these 25 years. The very important place which the laboratory holds in the well-known medical organization on the East Coast of Sumatra is clearly apparent. *W. J. Bais.*

i. HUGHES (M.). **Tropical Ulcer.**—*Malayan Med. Jl.* 1931. Dec. Vol. 6. No. 4. pp. 116–123. With 3 charts, & 3 figs. on 1 plate. [11 refs.]

ii. KERBY (T. R. F.). **Ulcus Tropicum, with a Reference to its Treatment by X Rays.**—*Lancet.* 1932. Jan. 30. pp. 235–237.

i. The author treated 77 cases of tropical ulcer in the Johore General Hospital; it is one of the commonest causes of disability among labourers in Malaya as elsewhere in the tropics. The average stay in hospital was 141 days, less for the younger and more, up to 232 days, for the older. He related it to ankylostomiasis but remarks later: "our figures for helminth infestation are low compared with Russell's for Malaya generally." All were males and the great majority Chinese. He states that BYRON found the calcium content of the blood of 84 Chinese suffering from ulcers to lie between 8·4 and 9·5 mgm. per 100 cc. [in the reference given the number of examinations was much smaller]; in 8 of his own cases the blood calcium was below 9·1 mgm. He divides the course of the disease into three stages: (1) the ulcer is filled with sloughs and spreading in all directions; (2) equilibrium; a mild sloughing destroys the granulations which have formed; (3) ulcer stationary or healing. In (1) treatment is directed towards the patient's general condition; removal of sloughs is inadvisable. In (2) debilitating factors should be sought and dealt with by appropriate treatment. Strong antiseptics may be applied to the sloughs and good results were obtained in two cases by quinine sulphate powder as recommended by INNES (*ante*, p. 237]. In (3) treatment consists in the application of adhesive elastic strapping, as described by DICKSON-WRIGHT. It has been used with success in 159 cases of ulcer from various causes. Sub-granulation skin grafting is done thus:—

"Long narrow Thiersch grafts are taken from an anaesthesia area in the thigh and threaded through the eye of a needle. The graft is then sown deeply in the fibrous base of the ulcer, the two ends being left sticking out. As many grafts as necessary are sown. An elastic adhesive bandage is applied immediately and changed at weekly intervals thereafter. After about 14 days small islands of epithelium will appear corresponding to the ends of the grafts. Healing may be complete in another ten days if enough grafts have been sown."

He stresses that the elastic adhesive bandage must never be applied except in the healing stage.

ii. Dr. Kerby notes that the incidence of tropical ulcer among the native employees of the Rhodesia railways has decreased enormously wherever the wearing of putties has been required. He has tried various forms of treatment but the best results were obtained by "a thorough curettage with the application of 'bipp'." As the result of treatment of 6 cases, then interrupted, by staphylococcus antivirus he thinks this method is worth further trial. Later good results are obtained by firm application of zinc oxide strapping. X-ray therapy was disappointing; he was unable to satisfy himself that any appreciable improvement followed. Zinc ionization was only useful in

cleaning up residual indolent patches. In all cases the patient is put on a liberal mixed diet with calcium lactate and cod liver oil, and examination is made for any pathological condition which requires treatment. *A. G. B.*

YOUNG (J. A.). **Ulcus Tropicum.**—*West African Med. Jl.* 1932. Jan. Vol. 5. No. 3. pp. 49–51.

Dr. Young discusses ulcus tropicum mainly with a view to its aetiology. He thinks the evidence for dietary deficiency, put forward by ORR and GILKS and by MCCULLOCH, by no means convincing. MCCULLOCH suggests that any mildly pathogenic organism may be the infecting agent, a second factor being absence of resistance. Objections to these suggestions are stated. The author notes that the infant and the aged escape, which is against a biting fly; that the agricultural tribes suffer heavily whereas the pastoral and hunting tribes escape lightly; that where there is marked seasonal rainfall the disease is most prevalent at the beginning of the rains: that it is improbable that infection is a mere chance transference, for in a large clinical experience he does not remember a single case of hospital infection. He notes the numerous failures to reproduce the disease, and points out that in the successes spirochaetes and fusiforms have always been present in the inoculum. These experiments cannot give clear results till pure cultures are possible. Finally, he advances a theory "which correlates most of the salient facts."

"The reservoir of infection may lie in the termite's nest—a natural moist incubator with an equable temperature. The surface activities of the termite are most marked at the onset of the rains. The immunity of the infant is explained, as is also the high incidence among field workers. Road gangs, whose work must drive ahead regardless of interruptions, would suffer heavily. One need not regard the termite as a specific carrier, it might be only a case of mechanical transmission on infected soil but the pre-ulcer bleb low down on the leg is readily explained as the termite is seldom permitted to climb any distance. Lastly, but not least, the termite has been shown to harbour a fusiform bacillus." *A. G. B.*

RICOU. Traitement des ulcères phagédéniques et autres plaies infectées par la poudre et la pommade Ballot. [**Treatment of Phagaedenic Ulcers by Ballot's Powder and Ointment.**]—*Bull. Soc. Méd. Chirurg. Indochine.* 1931. Nov.-Dec. Vol. 9. No. 10. pp. 803–806.

The treatment is said to be excellent but the formulas of the powder and ointment are not disclosed. *A. G. B.*

DELAMARE (G.), GATTI (C.) & BRUYN (D.). L'ulcère pseudo-membraneux du Paraguay. [**Pseudo-Membranous Ulcer of Paraguay.**]—*Bull. Acad. Méd.* 1932. Jan 26. 96th Year. 3rd Ser. Vol. 107. No. 4. pp. 115–119. With 3 text figs.

Single ulcers of this type were seen in three patients between the years 1927 and 1931 among 200 chronic ulcers of the lower limbs. Bacteriologically they suggest the ordinary tropical ulcer, but the phagedaenic process was slight or wanting. In one instance the ulcer was auto-inoculable. The fusiforms and spirochaetes disappeared with applications of chromic acid and two of the ulcers healed under arseno-mercurial treatment. *A. G. B.*

ASHFORD (Bailey K.). **Anaemia in Porto Rico.**—*Porto Rico Jl. of Public Health & Trop. Med.* 1931. Dec. Vol. 7. No. 2. pp. 119–144. [4 refs.]

In former days anaemia in Porto Rico was practically always taken to imply ankylostomiasis, but at present this infestation as a cause of serious illness or incapacity to work is probably not a tenth of what it used to be. The author analyses 300 cases selected from over 1,100 and concludes that many are due fundamentally to nutritional errors, protein starvation, excess of carbohydrates and fats, intestinal toxaemia, in conjunction with a monotonously warm climate and deficient exercise, resulting in bone-marrow changes, deficiency of hormone with, in many cases, definite hypoplasia. *H. H. S.*

ECKHARDT (August). Behandlung sekundärer Anämie mit Ferronovin in der Tropenpraxis. [**Treatment of Secondary Anaemia in the Tropics with Ferronovin.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1932. Feb. Vol. 36. No. 2. pp. 77–80.

Ferronovin is a preparation of the Chem. Fabrik Promonta, Hamburg, and is stated to contain liver substance, vitamin D and siderac (active oxide of iron). The author here shortly reports on 28 cases treated with this product with good results. *A. G. B.*

HEINEMANN (H.). Ueber die praktische Brauchbarkeit der Pallida-Reaktion im Arbeitskreis des Tropenarztes. [**The Practical Usefulness of the Pallida Reaction in the Routine Work of Physicians in the Tropics.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1932. Jan. Vol. 36. No. 1. pp. 9–19. [Summary appears also in *Bulletin of Hygiene.*]

The author has tested in the complement fixation test antigen consisting of a suspension of cultural *Sp. pallida* in carbolized saline, as recommended by GAEHTGENS (*Bulletin of Hygiene.* Vol. 5. pp. 318 & 724). The antigen was obtained from the Sächsisches Serumwerk, Dresden. It was used in a dilution of 1 to 2, the amount added being 0·25 cc., with the same amount of patient's serum diluted 1 to 5, and 0·25 cc. of the required complement dilution. The method was tested on 526 sera from 436 patients, in parallel with the routine Wassermann, Müller's test and Meinicke III. In cases of syphilis and yaws it gave 93 per cent. positive reactions against routine W.R.62; Meinicke III, 55; and Müller, 75. In 16 sera from Europeans and better class Chinese with various diseases but no history or sign of syphilis or yaws all the methods gave negative reactions. In 265 sera from Javanese and Chinese hospital patients with no clinical sign of syphilis or yaws were 66 which gave positive reactions to one or more of the tests. Examination of the histories of these cases showed that all but 19 had most probably been infected with either syphilis or yaws. The tables relating to these 19 cases show that they gave positive reactions as follows:—One with all four tests; two with routine and Pallida Wassermanns and with Müller; one with routine Wassermann and with Müller; one with Müller only; three with Müller and with Pallida Wassermann; ten with Pallida Wassermann only; and one with routine Wassermann only. The author concludes that the

Pallida antigen affords Wassermann tests with a high degree of sensitiveness, which usefully complements tests by the routine Wassermann and by Müller's method. [In spite of the author's explanations, the impression left by a study of the figures is that, while the Pallida method gave a much higher percentage of positive reactions in syphilis, it gave too many positives in non-syphilitic cases to be regarded as safe enough for diagnostic purposes. It appears, in fact, to be a good method for exclusion of syphilis and for early detection of relapse in treated cases.] *L. W. Harrison.*

CH'IN (T. L.). **Syphilis of the Toes resembling Fungus Infection (Hongkong Foot). Report of Three Cases.**—*Chinese Med. Jl.* 1932. Jan. Vol. 46. No. 1. pp. 60–63. With 2 figs. on 1 plate.

"Three cases of early secondary syphilis are reported in which the toes were involved in an ulcerative process closely resembling that frequently observed in superficial fungus infections of the skin. The presence of vesicular lesions in one case, and of a history suggestive of recurrent tinea infection in another raised the presumption of an antecedent fungus infection being a predisposing cause for the unusual localization of the syphilitic lesions."

No mycological study was carried out, and in two of the cases arsphenamine injections led to the disappearance of the ulcers. The third patient ceased attendance. *A. G. B.*

SCHILLING (Victor). Neuere Leistungen der Methode des "Dicken Tropfens." [**New Uses for the "Thick Drop" Method.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1932. Apr. Vol. 36. No. 4. pp. 230–239. [25 refs.]

The author refers to the great use that may be made of the thick drop and warns against simple draining off of the staining fluid. It should be gently washed off with distilled water to prevent adhesion of deposit to the film. It is advisable, moreover, to change the staining solution at least once by this method before the final removal of stain altogether. The newer uses of the thick drop method are considered from the point of view of the demonstration of polychromasia, "inclusion" bodies, and "erythrokonts" in true blood diseases. *W. F. Harvey.*

PONS (Juan A.). **The Red Cell Count and Hemoglobin in Porto Rico. From an Analysis of Hospital Cases.**—*Porto Rico Jl. of Public Health & Trop. Med.* 1931. Dec. Vol. 7. No. 2. pp. 203–208.

TORGERSON found the average red cell count of 100 hospital patients in Porto Rico to be 3½ millions [this *Bulletin*, Vol. 28. p. 73] and SUAREZ gave 3·3 millions as the normal red cell count and 75 per cent. as the normal haemoglobin for the island. Pons's counts were made by five observers, to avoid personal errors; the Dare haemoglobinometer was used. The average red cell count of 180 hospital admissions was 3·81 millions and haemoglobin 67·66 per cent. and when cases of manifest anaemia were eliminated the average count for 164 cases was 4·05 million and haemoglobin 71·56. For 96 private cases the counts

and haemoglobin were both a little higher. Details are given in tables. It is noted that these values are considerably higher than those given by others. *A. G. B.*

CORBETT (G. H.) & HODGKIN (E. P.). **Laboratory Experiments on the Larvicidal Properties of Mineral Oils.**—*Bull. Inst. Med. Res. Federated Malay States.* 1931. No. 5. 20 pp. With 17 figs. [3 refs.]

The authors undertook a series of laboratory experiments in order that they might specify the properties which give larvicidal powers to mineral oils. Their paper contains a mass of careful work carried out under standard conditions: in most of the experiments they used fourth-stage larvae of *Anopheles vagus*. They present their results in such a way that one can see the very considerable inconsistencies that they got when experiments were repeated. For instance, using a particular sample of "heavy oil" they carried out five identical experiments at the same time, 100 larvae being used in each. After two hours the number of larvae killed ranged between 71 and 92 per cent. Apart from these inconsistencies, there are great difficulties of a physical nature, because two oils may be identical in most of their properties and yet widely different in some other property—a fact which is well known to workers on lubrication. Then again there are the biological difficulties, which arise from the fact that none of the physical properties of the oil gives a direct measure of its larvicidal efficiency. Moreover, we have no precise knowledge of the substances present in mineral oils which make them toxic to insects, though we know that the mere presence of oil in the tracheal system is not in itself harmful.

As a result of their work, the authors find that there are several factors which are of primary importance in a larvicidal oil. Among them are viscocity and surface tension; these control the spread of the oil on water and also its power of entering the spiracles of the insect. They mention also the aromatic content of the oil, its toxicity to larvae, and the degree to which a film which has been exposed to the air for several days retains its poisonous properties.

The reader of this careful report must feel some surprise that we are still so ignorant, for oiling is one of the oldest ways of controlling mosquitoes and is still of great value. The problems are of extreme complexity; the reviewer believes that they will eventually have to be studied for several years by at least two men: one should be an expert in surface chemistry and if possible should have considerable knowledge of oil technology, and the other should be an experimental biologist. *P. A. Buxton*

TANNER (W. F.). **Inspection of Ships for Determination of Mosquito Infestation. With Appendix.**—*Public Health Rep.* 1931. Sept. 25. Vol. 46. No. 39. pp. 2306-2320. [Summary appears also in *Bulletin of Hygiene.*]

Records show that, in the days of sail, ships from yellow fever infected ports did sometimes harbour infected *Aedes aegypti*. Very little work has been done to ascertain to what extent mosquitoes, particularly the vectors of yellow fever, will survive on board steam

ships. A scheme was carefully worked out to determine this on vessels trading from ports in Central and South America and the West Indies to New Orleans and New York. The co-operation of the United Fruit Company was enlisted, but the investigation was hampered by the facts that inspection at the port of arrival had to be carried out without delay to ships, there was a dearth of trained inspectors, records kept by the ship surgeons were not sufficiently detailed and insecticides were commonly used during the voyage. But the evidence collected does tend to show that modern steamships do not provide breeding places for mosquitoes nor do they persist on board for more than two or three days after the ship leaves an infested port. If conclusive evidence is to be obtained it will be necessary to station trained personnel at the ports of departure to report full details of local conditions in regard to the ships and for trained inspectors to travel on board such vessels as are known to have been exposed to mosquito infestation.

Chas. F. White.

YEAGER (Clark H.). **Bored-Hole Latrine Equipment and Construction.** —*Philippine Jl. Sci.* 1931. Dec. Vol. 46. No. 4. pp. 681–749. With 46 text figs. & 7 plates. [10 refs.] [Summary appears also in *Bulletin of Hygiene.*]

Bored-hole latrines are permissible only in positions where there is no danger of infecting sources of domestic water supply. They can be installed in places where water is not encountered, but the disintegration of the dejecta appears to be not as rapid or complete as in latrines with a metre or two of water in them. The dry latrines do not last as long as those containing water, but with proper use a latrine not containing water should not be filled by an average family in less than four years. The author gives fully illustrated descriptions of the different types of boring plant required to meet varying conditions of soil and rock, methods for the lining of the bore-hole where necessary and the installations of latrine and water closets for bore-holes which have been found practicable and hygienic. *H. Home.*

CHOPRA (R. N.) & MUKHERJI (B.). **Indian Species of Artemesia.**— *Indian Med. Gaz.* 1931. Nov. Vol. 66. No. 11. pp. 622–625.

Artemisia brevifolia Wall, which contains santonin, grows abundantly in parts of Kashmir but the cost of the raw material and of transport is too great for successful manufacture. Recently another species, *A. maritima*, has been found in the Kurram Valley in the North West Frontier Province growing freely; unfortunately the santonin content is poor, about half of that of Kashmir. Whereas Russian artemisia yields 1·2 to 1·4 per cent. the yield for Kashmir is 0·5 per cent. The month of collection is important: in June the plant contained no santonin, in July and August 0·1 to 1·0 per cent., in September 0·1, and later none at all. The therapeutic efficacy has been tested by Chopra and CHANDLER [see this *Bulletin*, Vol. 22, p. 672] but MAPLESTONE and Mukherji failed to obtain such good results and advise a combination of chenopodium and santonin for ascariasis. The demand in India for santonin is large. *A. G. B.*

CHOPRA (R. N.) & MUKHERJI (B.). **Indian Chenopodium.**—*Indian Med. Gaz.* 1932. Jan. Vol. 67. No. 1. pp. 5–7.

This is an enquiry of the Indigenous Drugs Committee of the Indian Research Fund Association. Chenopodium was used by the American Indians in the time of Columbus ; it was introduced to Europe in 1881 for hookworm disease with discouraging results, but SCHÜFFNER and VERVOORT (1913) in Sumatra recorded excellent results with it [this *Bulletin*, Vol. 1, p. 700]. It is obtained from American wormseed from which the oil is distilled in Baltimore and Illinois. The active principle, ascaridole, varies in the samples from 40 to 70 per cent. Chenopodium grows also in the East Indies and India. Its cultivation was tried in two places in India but with no commercial success.

Examination by HENRY and PAGET showed that whereas the American oil contained 65 per cent. ascaridole the Indian content was only 46 per cent. Other differences appear in a table. However the clinical effects of the Indian product appear to have been good. The yield of poor oil may be due to poor cultivation or to faulty distillation methods. Though the introduction of carbon tetrachloride has reduced the demand for chenopodium, since mixed parasitic infection is the rule in India a demand is likely to remain. However the price of chenopodium oil is 32 rupees per lb. against $2\frac{1}{2}$ for CCl_4. In Java cultivation has produced an oil which approaches the standard American oil closely. *A. G. B.*

TOURNIER. Le kermès. Ses applications en pathologie exotique. [**Kermes and its Employment in Tropical Medicine.**]—*Ann. de Méd. et de Pharm. Colon.* 1931. Oct.-Nov.-Dec. Vol. 29. No. 4. pp. 871–875.

Kermes is a compound of sulphide of antimony and pyro-antimoniate of sodium in the proportion of 7 : 2 ; it is insoluble in water but soluble in acids. It exists in two forms, the most active of which is a coarse violet-red powder. It is given by the mouth either in cachets or in a draught in doses up to 40 cgm. 3–4 times daily ; larger doses may provoke vomiting. It causes no unpleasant symptoms either during its administration, which may be prolonged for 3 months, or afterwards. Herein it has a great advantage over tartar emetic. It must be kept in coloured bottles and only made up when required. The author has used it for guinea worm, in vesical schistosomiasis (one case mentioned), in visceral leishmaniasis (2 cases) and in leprosy. It is advised for children, old people, and patients with heart lesions, rather than tartar emetic. *A. G. B.*

FAKHRY (A.). **A Case of Severe Asphyxia after a Tartar Emetic Injection resuscitated by Cardiac Puncture.**—*Jl. Egyptian Med. Assoc.* 1932. Mar. Vol. 15. No. 3. pp. 106–107.

A female of 52 kilos with round worms and *Schistosoma haematobium* received 1 grain of tartar emetic (6 per cent. sol.) intravenously. She shortly became unconscious, with face cyanosed, respirations slow and shallow, insensitive corneae and heart sounds inaudible. Artificial respiration and injection of various drugs did not avail to restore her till adrenaline was injected into the heart cavity. She revived after $1\frac{1}{2}$ hours. The author in about 120,000 injections of tartar emetic has not encountered such symptoms. *A. G. B.*

WILLIMOTT (Stanley G.). **A Fatal Case of Quinine Poisoning.**—*Lancet.* 1931. Nov. 21. p. 1133.

A child of 5 years swallowed 26 5-grain tablets of sugar-coated quinine sulphate, and died in asphyxia 3½ hours later. Chemical examination discovered quinine in the stomach and a trace in the liver, none in other organs. *A. G. B.*

ZANETTI. Index de robustesse pour le recrutement des travailleurs au Congo Belge (index de Pignet et Lefrou). [**Index of Robustness for the Recruiting of Labour in Belgian Congo.**]—*Ann. Soc. Belge de Méd. Trop.* 1931. Dec. 31. Vol. 11. No. 4. pp. 423–441.

The author points out that for big industries or enterprises of construction recruiting at a more or less great distance is essential and that the first selection is non-medical. He discusses here the relative merits of the index of Pignet, that of Lefrou [this *Bulletin*, Vol. 28, p. 865], and simple inspection. Of 7,890 labourers recruited in Belgian Congo 1,966 had a Pignet of 0–20, and 91·9 per cent. completed their contract; 3,238 had a Pignet of 21–30 and of these 88·6 per cent. completed; 813 had a Pignet of 36 and over and only 47 per cent. completed. LEFROU's index differs from PIGNET's in that the sitting height replaces the standing height. These indices are compared for batches of different tribes classed according to height, and it is noted which natives would be refused or accepted by the methods in question. A general conclusion is that Pignet's index gives more recruits than Lefrou's for the Bantu as compared with the Sudanese races. The author evidently prefers Pignet. *A. G. B.*

CHAPPAZ & THIERRY. Sur les mesures administratives prises en Tunisie contre les rongeurs. [**Administrative Measures against Rodents in Tunis.**]—*Tunisie Méd.* 1931. Dec. Vol. 25. No. 10. pp. 571–574.

The measures consisted in the use of poisoned baits, nux vomica 1 kgm. to 10 kgm. of corn (wheat, barley or oats), or "campagnolicide AL" the base of which is strychnine, 11 gm. to 5 kgm. of corn. Nux vomica acts so quickly that the gerbille is seized with convulsions before it can retreat to its hole. The corpses are collected next day. In an area of 200 sq. metres 377 were found. The cost is 5 to 10 francs a hectare. The proprietary substance was equally effective but more costly. The results are stated to have been good in the saving of the olive trees, but the seasonal reappearance of plague was not prevented. *A. G. B.*

i. HASSELMANN (C. M.). Studies on Glandular Fever (Druesenfieber Pfeiffer) with Lymphoid Reaction. Report of the First Cases from the Tropics.—*China Med. Jl.* 1931. May. Vol. 45. No. 5. pp. 385–432. With 3 charts in text & 3 figs. on 2 plates. [3 pages of refs.]

ii. ——. Ueber lymphoide, letale Reaktionen im Säuglings- und Kleinkindesalter in den Tropen. [**Lethal Lymphoid Reactions in Nurslings and Young Children in the Tropics.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1931. Dec. Vol. 35. No. 12. pp. 687–695. [Refs. in footnotes.]

i. This long paper describes three case of glandular fever with lymphoid reaction which came under the care of the author in the Philippine

Islands, and in addition the etiology, symptomatology and differential diagnosis of the disease are fully treated. Careful blood counts were carried out in each case and the types of cells which predominated in the blood picture are carefully described. The method of making blood films was Naegeli's cover slip method and Grübler's original Giemsa stain is recommended as the only stain which could be relied on to differentiate the various types of cells.

ii. Covers much the same ground. Fatal cases in children of 4 years and 4½ months are described. *D. Harvey.*

JAMES (Clifford S.). **Tropical Myositis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1931. Nov. 30. Vol. 25. No. 3. pp. 177–180.

The author, of the Methodist Mission Hospital, Choiseul, British Solomon Islands, is moved by the communication of Dr. SAYERS [this *Bulletin*, Vol. 28, p. 46] from New Georgia in the same group to record his own observations. The population of Choiseul consists of 4,085 "local natives," most of whom live on the beach and 100 Malaita labourers, figures not very dissimilar to SAYERS'. Among these there were 5 cases of myositis in one year against SAYERS' 19, and 15 microfilarial infections in 204 natives (against Sayers' one in 150), so that Choiseul with a higher filaria rate has less myositis [the figures, however, are too small for any but tentative conclusions]

Some details are given of 10 cases of myositis; in the blood of the 7 examined he failed to find microfilariae. Three cases are described in which myositis followed immediately on the development of pus in septic foci, boils in two instances and abscess under the toe in a third.

A. G. B.

BONNE (C.). Het primaire levercarcinoom. [**Primary Liver Carcinoma.**]—*Nederl. Tijdschr. v. Geneesk.* 1932. Jan. 30. Vol. 76. No. 5. pp. 438–445. [2 refs.]

The occurrence of primary liver carcinoma among Javanese and Chinese seems to be definitely much higher than in European races. Various possibilities of statistical selection are considered but will not account for the difference. In the case of the Netherlands Indies the possibility of etiological relationship to infection by *Clonorchis sinensis* or the presence of schistosome eggs in the portal capillaries is excluded. As primary liver carcinoma and cirrhosis are very intimately connected, it may be that in Java alcohol is a causal factor in the production of both conditions. The international list of causes of death unfortunately combines under the same heading cancers of liver and stomach. But while cancer of the liver in Europe is commonly metastatic, secondary to cancer of the stomach, in Java primary cancer of the liver is of high frequency. *W. F. Harvey.*

MORENO PEREZ (I.). Informe preliminar sobre la epidemia de Muzo en el año de 1931. [**The Epidemic at Muzo in 1931.**]—*Repert. Med. y. Cirug.* Bogota. 1931. July. Vol. 22. No. 7 (259). pp. 323–331.

Muzo is a small town nearly 100 miles north of Bogotá, Colombia, in a hilly district 2,000 to 3,000 ft. above sea level. Outbreaks of disease

have occurred there from time to time, four of which are referred to: (1) In 1907, when there were 45 cases, with 6 deaths, reported as yellow fever; (2) in 1916, when a Commission under GORGAS was sent out by the Rockefeller Foundation, but arrived too late for satisfactory investigations. The members could not find Aedes and on the basis of replies to questions concluded that the condition was not yellow fever but malaria; (3) in 1927 another outbreak took place and was reported as yellow fever, but patients presenting symptoms identical with those so recorded were found to have numerous malaria parasites, mostly *P. falciparum*, in their blood; (4) in 1931, the outbreak referred to in the title of this article occurred and was also at first designated yellow fever. The National Department of Health sent out men to study it and of the first 22 patients all had malaria parasites. A neighbouring district, Coper, also reported cases (78) but the decision was arrived at that this was influenza with a small admixture of malaria. The total number of patients treated in Muzo was 423 [the fatality rate is not stated, but the general impression gained is that it was very low]; the blood was examined of 397 and parasites were found in 290 or 73 per cent.—227 *P. vivax*, 58 *P. falciparum*, 5 *P. malariae*. Of 407 persons examined 273 (67 per cent.) had enlarged spleens. *Anopheles pseudopunctipennis* was abundant.

The question whether any of the patients had suffered in previous epidemics is not mentioned, but there occurs the statement that "in 3 weeks 315 new cases were treated and 65 who had been treated previously"; whether these were instances of second attacks cannot be determined from lack of evidence. The author concludes that "the epidemics which have taken place at irregular intervals in the last 15 years at Muzo were not yellow fever but malaria of pernicious form." *H. H. S.*

STEULLET (R.). Un cas de parasitisme de l'urèthre par une sangsue *Limnatis nilotica* (Savigny, 1820). [**Parasitism of the Urethra by a Leech.**]—*Arch. Inst. Pasteur d'Algérie.* 1931. Sept. Vol. 9 No. 3. pp. 481–483.

This leech which is found in South Europe and North Africa is not able to pierce the skin and is therefore a parasite of mucous membranes. Its body is soft like that of the medicinal leech. It has been found in man in the upper air ways, upper digestive tube, vagina and conjunctiva. The patient was a man of 70 years who complained of nothing but bleeding from the urethra. A calculus or other foreign body was suspected but examination revealed nothing and a sound could be passed freely into the bladder. On the 6th day a small red object appeared at the meatus, thought to be a pediculated tumour suitable for operation till the patient presented himself with a leech in his hand which he had pulled out. *A. G. B.*

NICOLLE (Charles). La maladie du jeune âge des chiens est transmissible expérimentalement à l'homme sous forme inapparente. Portée de cette constatation. [**Dog Distemper transmitted experimentally to Man in Inapparent Form; Bearing of this Observation.**]—*Arch. Inst. Pasteur de Tunis.* 1931. Dec. Vol. 20. No. 3. pp. 321–323.

Though man contracts several diseases from animals we know no animal diseases of human origin. With the possibility in mind of

filling the gap the author inoculated a man, a monkey and a puppy with 5 cc. of defibrinated blood from a puppy infected with distemper virus. The dog had fever after the usual interval and had a proved attack of distemper. The man and monkey had no symptoms of any kind. On the 6th day two puppies were inoculated from the man and the monkey respectively and rigorously isolated. The dog inoculated from the man had fever on the 4th day and two dogs inoculated from it were positive. The dog inoculated from the monkey was unaffected. The bearing of the observation if confirmed need not be laboured. The author supposes that distemper was primitively a disease of man.

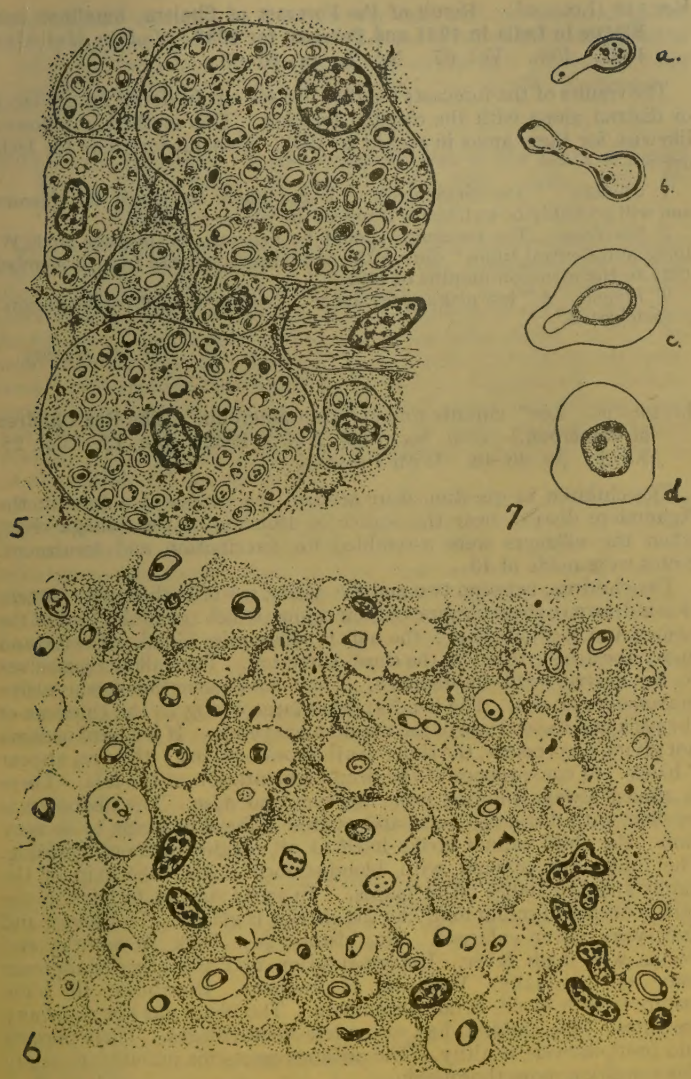
A. G. B.

CRUMRINE (R. M.) & KESSEL (John F.). **Histoplasmosis (Darling) without Splenomegaly.**—*Amer. Jl. Trop. Med.* 1931. Nov. Vol. 11. No. 6. pp. 435–449. With 7 text figs. [10 refs.]

This is a careful study and record of another case of the interesting and obscure condition first reported by DARLING in 1906 as an infection by a hitherto unknown organism and designated by him *Histoplasma capsulatum.* There have been only 4 cases previously recorded. The history of this patient is: An adult white man [age not stated] complained of weakness and cough for 6 months, diarrhoea and loss of weight 3 months. The first symptom had been abdominal pain increased by food, but appetite good. He lost 33 lbs. in the 6 months. W.R. negative. When he first came to hospital on April 17th, 1928, nothing abnormal could be felt in the abdomen, but on 23rd May a sausage-shaped mass was obvious and increasing in size, though not tender; it was believed to be a mass of enlarged glands. There was a little fever, but never above 102·5°F. and usually about 101° in the evening, 99° in the morning. Diarrhoea without mucus or obvious blood (test for occult blood was positive) continued and the weakness increased, death occuring on 20th June. Autopsy revealed a mass of discrete enlarged glands, in the abdomen, many caseous, spleen slightly enlarged 12×8·5×4 cm., also with white nodules suggestive of Hodgkin's disease. There was marked ulcerative colitis, 25–30 ulcers 1–2 cm. in diameter and about 50 smaller. Microscopically, the nodes, spleen, liver, ulcers and lungs showed phagocytic cells packed with yeast-like organisms, which bore a superficial resemblance to leishmania bodies but differed in possessing a capsule and having no blepharoplast; there were no giant cells nor acid fast bacilli.

The organism is described in detail; it was found in two stages, a minute intracellular and larger extracellular (see figure). No mycelia were seen, the organisms being yeast-like. It is almost certainly a fungus, not a protozoon, and is better named *Cryptococcus capsulatus* Darling 1906. Attempts at cultivation were unsuccessful.

This case differs from those previously described in the absence of splenic enlargement. This the author explains by saying that perhaps the patient did not live long enough. WATSON's patient (see this *Bulletin*, Vol. 26, p. 804) had complained of cough for 20 years and had an enlarged spleen for 8 years before her death. DARLING's original case, however, was ill for 3 months only, or less than half the one described in this paper, nevertheless the splenic enlargement was a notable feature (see also this *Bulletin*, Vol. 24, p. 68). *H. H. S.*



Cryptococcus capsulatus. Intra- and Extra- Cellular Forms.

Fig. 5. Camera-lucida drawing of endothelial cells of lymph node packed with intracellular phases of organism. × 1925.

Fig. 6. Camera-lucida drawing of extracellular encapsulated stages in the spleen. × 1925.

Fig. 7. Camera-lucida sketches of isolated organisms. × 3200.

a and *b*, budding extracellular forms without capsules; *c*, budding extracellular forms within a capsule; *d*, extracellular phase within a capsule, showing characteristic yeast-like structure.

[Reproduced from *American Journal of Tropical Medicine.*]

ROGERS (Leonard). **Result of the Forecast of Cholera, Smallpox and Plague in India in 1931 and Forecast for 1932.**—*Indian Med. Gaz.* 1932. Feb. Vol. 67. No. 2. pp. 61–63.

The results of the forecasts for 1931 are set out in detail for province or district along with the original forecast. This method is followed likewise for these areas in regard to 1932. General forecasts for 1932 are :—

1. Cholera. " The incidence . . . is not likely to exceed the average and will probably be well below it unless the winter rains fail."
2. Smallpox. The incidence should be beneath the average in N.W. India and Central India " during the annual seasonal rise from November 1931 to the monsoon months of 1932."
3. Plague. A " low plague prevalence . . . during the 1931–1932 season" is anticipated.

W. F. Harvey.

LIEURADE. Les " enfants rouges " du Cameroun. [**The Red Children of Cameroon.**]—*Bull. Soc. Path. Exot.* 1932. Jan. 13. Vol. 25. No. 1. pp. 46–48. With 1 text fig.

The children in question were seen in the course of a tour in the Ngaundere district near the source of affluents of the Sanaga river, when the villagers were assembled for vaccination and treatment. Notes were made of 13.

The children, between two and five years, are of both sexes. Attention is drawn to them because of their colour, which resembles that of the cashew nut (acajou clair) ; the hair is often quite blond. They stand apart, the arms crossed on the chest, shivering. They allow themselves to be moved with indifference. They have sometimes convulsive movements or tics. The head appears large owing to the thinness of the neck and the oedema of the cheeks and eyelids. It is a hard oedema not giving on pressure, the skin over it appears glazed ; the eyes appear " black " in consequence of the deep pigmentation of the lids. There is almost always running from the eyes and nose. The abdomen is swollen, with distended veins and ascites. The skin seems to be very thin ; the child cannot strike itself at all roughly without bleeding. The limbs are covered with blood-stained scars ; the skin of the hands and feet flakes off in places. In parts subject to friction the skin is deeper in colour and, like the cheeks, is glazed. The spleen and liver were never enlarged. The history goes back 18 months and begins with high fever. Depigmentation and the other symptoms come on gradually. Vomiting is frequent. Diarrhoea, in some instances with blood, is not uncommon. The blood did not show any parasites. The children had never left their villages. Their parents and brothers were healthy. The author regrets his inability to study this condition more thoroughly. *A. G. B.*

VAUCEL & SALAÜN (G.). Contribution à l'étude du pneumocoque en Afrique Equatoriale Française. [**A Study of the Pneumococcus in French Equatorial Africa.**]—*Bull. Soc. Path. Exot.* 1932. Jan. 13. Vol. 25. No. 1. pp. 58–65.

Thirty-nine strains were isolated from a variety of lesions and twenty-nine were studied in some detail. A large proportion of these

(62 per cent.) belonged, as is usually the case with pneumococci in the tropics, to group 4, but 18 of them (41·4 per cent.) could be allocated to a subgroup for which an agglutinating serum had previously been prepared to a strain sent from Brazzaville. *W. F. Harvey.*

HOPKINS (H. Hanford). **Subcutaneous Nodules of the Juxta-Articular Type.**—*Bull. Johns Hopkins Hosp.* 1931. July. Vol. 49. No. 1. pp. 5–16. With 8 figs. [20 refs.]

In the Syphilis Clinic 14 cases—2 males and 12 females, 9 negroes and 5 whites—were studied. The W.R. was positive in 13; 8 had other clinical manifestations of syphilis. In 12 the nodules were characteristically placed over the extensor surfaces of the forearms near the elbows; 4 had nodules as well over tibial tuberosities. In one the nodes were generalized. In 7 of 8 cases which received regular treatment, arsphenamine plus bismuth, the nodules disappeared. Nodules excised from four cases showed a histological picture not differing from that described by previous observers. In none were spirochaetes revealed. One proved to be a pure xanthoma. A single attempt to infect a rabbit did not succeed.

In the generalized case, a syphilitic with positive W.R. and chronic polyarthritis, nodes were present over occiput, ears, neck, elbows, fingers, sacrum, ischial tuberosities and Achilles tendons and were resistent to treatment. Four of these nodules were excised and exhibited features claimed by students both of syphilis and rheumatism to be characteristic. As they did not respond to treatment the author considers them as of rheumatoid origin. From evidence gleaned from the literature it would appear therefore that J.A.N. may be associated with a number of diseases:—rheumatic fever, rheumatoid arthritis, yaws, leprosy, syphilis, filariasis, scleroderma, acrodermatitis chronica atrophicans, and may be simulated by xanthoma. *H. S. Stannus.*

SAMBON (M.) & ESTAS (P.). Notes sur un cas de nodosités juxta-articulaires. [**Case of Juxta-Articular Nodules.**]—*Bull. Méd. du Katanga.* 1931. Vol. 8. No. 6. pp. 172, 175–177.

Records a case of J.A.N. at Jadotville, Ruanda-Urundi. No history of yaws or syphilis; W.R. negative. Histologically the picture resembled that now well known. No spirochaetes or other organism found. Intratesticular inoculation into rabbits negative. Injections of cyanide of mercury, N.A.B. and Bi-yatren without effect. *H. S. Stannus.*

BOGGIAN (Bruno). Cutireazione alla tubercolina e malaria. [**Tuberculin Skin-Reaction and Malaria.**]—*Riv. di Patol. e Clin. d. Tubercol.* 1931. July 31. Vol. 5. No. 7. pp. 580–582. [13 refs.]

SEGURA noted in 1925 that at Algeçiras when malaria became more severe the mortality from tuberculosis increased, also that whereas severe malaria "with a tendency to chronicity and quinine resistance" predisposes to and aggravates tuberculosis the benign forms appear to have an immunizing action. MACCIOTTA studying the interrelation at the Royal Institute of Puericulture, Sassari, came to the conclusion that such a predisposition did exist and that it was due to "profound metabolic changes depriving the body of its defences."

The author tested 16 malarious subjects, 3 chronic, 9 benign tertian, 3 subtertian, 1 quartan, and 16 non-malarious in whom no tuberculous infection could be diagnosed by clinical and radiological examination. The results, shown in a table, were : one chronic malaria gave + + +, one + and one —, two benign tertian gave +, as did one of the subtertian ; that is of the 16 there were 11 negative, one strongly and four weakly positive. Of the controls 8 gave + + + , 4 gave + + or +, and only 4 were negative. He infers from these results that malaria gives rise to a state " analogous to that present in advanced tuberculosis when the organism is deprived of its antibodies and has no defence against the disease." [A somewhat comprehensive induction on such slender evidence.] *H. H. S.*

ABBATUCCI (S.). La maternité en Afrique noire.—*Rev. d'Hyg. et de Méd. Préventive.* 1932. Feb. Vol. 54. No. 2. pp. 95–107. [3 refs.]

BURTON (A. W.). A Medical Service for Natives in Rural Areas.—*Jl. Med. Assoc. South Africa.* 1931. May 23. Vol. 5. No. 10. pp. 303–307.

CLARK (J. Tertius). The Bearing of Tropical Experience on the Views of the Pathogenesis of Rheumatic Fever.—*Jl. Trop. Med. & Hyg.* 1931. Sept. 15. Vol. 34. No. 18. pp. 301–303.

CLELAND (J. Burton). Plants, including Fungi, Poisonous or Otherwise Injurious to Man in Australia. Series III.—*Med. Jl. Australia.* 1931. Dec. 19. 18th Year. Vol. 2. No. 25. pp. 775–778. [16 refs.]

COOPER (George William). Outline of Culture Character Studies of an Undescribed Species of Cryptococcus.—*Amer. Jl. Trop. Med.* 1932. Jan. Vol. 12. No. 1. pp. 97–100.

CORMACK (E. A.). A Case of Ainhum of the Finger.—*West African Med. Jl.* 1932. Jan. Vol. 5. No. 3. p. 46. With 1 fig.
The little finger. Both little toes had been lost from the same cause.

GRASSET (E.) & ZOUTENDYK (A.) Immunological Studies in Reptiles and their Relation to Aspects of Immunity in Higher Animals.—*Publications of South African Inst. Med. Res.* 1931. Nov. Vol. 4. No. 29. pp. 377–460. With 28 figs. on 15 plates.

HAY-MICHEL (A.). Medical Services for Rural Areas.—*Jl. Med. Assoc. South Africa.* 1931. Sept. 12. Vol. 5. No. 17. pp. 555–558.

LEDENTU. Les maladies transmissibles observées dans les colonies françaises et territoires sous mandat, pendant l'année 1929.—*Ann. de Méd. et de Pharm. Colon.* 1931. Oct.-Nov.-Dec. Vol. 29. No. 4. pp. 661–851.

MATTLET (G.). Quelques considérations sur des cas de fièvre paratyphoide " C " et contribution à l'étude des bacilles paratyphoides " C."—*Ann. Soc. Belge de Méd. Trop.* 1931. Dec. 31. Vol. 11. No. 4. pp. 455–478.

MOFFAT (H. A.). Medical Services in Native Areas and the Training of Native Medical Practitioners.—*Jl. Med. Assoc. South Africa.* 1931. Nov. 28. Vol. 5. No. 22. pp. 738–740.

SANTOS ZETINA (Felipe). Coexistencia de lepra tuberculosa con leishmaniosis cutanea.—*Rev. Méd. de Yucatán.* 1932. Feb. Vol. 16. No. 11. pp. 207–210.

SEQUEIRA (J. H.). The Influence of Light and Heat on the Human Body.—*Kenya & East African Med. Jl.* 1932. Mar. Vol. 8. No. 12. pp. 332–358. [29 refs.]

TROLLI (G.). Le Service d'Assistance Médicale Indigène au Congo Belge. (S.A.M.I.).—*Bruxelles Méd.* 1932. Mar. 6 & 13. Vol. 12. Nos. 19 & 20. pp. 539–541 ; 561–564.

ZIEMANN (Hans). Neueres aus dem Gebiete der Infektionskrankheiten, der Parasitologie und der exotischen Pathologie.—*Med. Klin.* 1930. No. 8/9. 19 pp. ; 1931. No. 30/31. 22 pp.